November/December 2006 >> Vol.28

AECMAGAZINE

DESIGN, MANAGEMENT & COLLABORATION IN THE BUILT ENVIRONMENT



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AEC MAGAZINE
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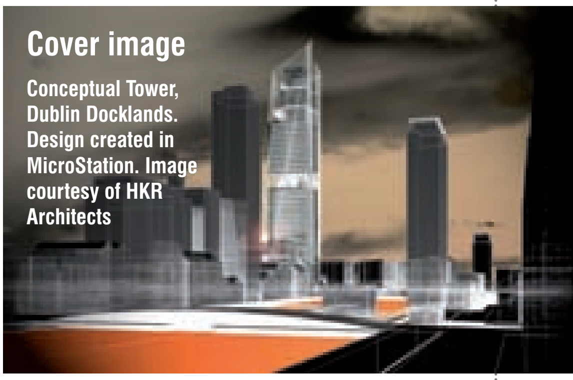
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Cover image
Conceptual Tower, Dublin Docklands. Design created in MicroStation. Image courtesy of HKR Architects



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Rhino to be tuned for architecture

Architects from across the UK gathered at the Daniel Libeskind designed London Metropolitan University Graduate Centre last month to attend the first ever architecturally focussed event for users of Rhino, the freeform modelling tool.

Hosted by UK reseller, Simply Rhino, 'Shape to Fabrication' provided a platform for developer McNeel to deliver its vision for Rhino within architecture, showcase new and future software releases and give a cross section of users from the construction sector the chance to share their broad experiences of the powerful NURBS-based modeller.

Originally developed for product designers and automotive stylists, Rhino has built up a strong following in the architectural sector over the years. However, as McNeel's Scott Davidson admitted the company has never really focussed its development efforts on this market before now. Davidson explained that in response a growing customer base within the architectural sector, McNeel has now put a team together to focus purely on the needs of architects.

Event attendees were given a whistle stop tour of the upcoming Rhino v4 release, which includes a number of tools designed to help architects, contractors, and fabricators. Features including improved modelling functionality were demonstrated, which have been developed with a view to giving architects more freedom in design. Enhanced editing tools that make it easier to change a design once the model is formed were also shown. In relation to this, Rhino's new Universal Deformation Technology (UDT) allows users to edit models in their entirety without having to predetermine how they are going to do this before the model is built.

Attendees were also given a glimpse of the future with a new tool which enables architects to create parametric walls, doors, windows etc inside Rhino and also generate sections and elevations. McNeel was keen to point out that it was not trying to create a product that is similar to Revit, ADT, or Allplan, but instead wanted to provide architects with a solution that delivers core modelling tools in addition to its powerful freeform modelling functionality. Next generation rendering technology, and new customisation tools were also on show.

Over the course of the day customer presentations highlighted just how adaptable a product Rhino has become in the construction sector. EDAW delivered an excellent presentation on utilising Rhino in urban design. The company uses Rhino to help explore the interaction of natural and manmade structures and showcased their work on several projects, including the Lower Lee Valley regeneration masterplan for the London 2012 Olympic bid. EDAW's work on the regeneration of Blackpool's promenade, which combines sea defences with seating, showed how Rhino was used first to model the modular units then create 1:20 scale CNC machined models from the data for wave tank testing.

Among the other presentations Arup's advanced Geometry unit demonstrated how they are customising Rhino to drive the creation of complex geometric forms then linking to its GSA analysis software to help optimise the structure. Similarly, Buro Happold's SMART analysis and research team explained how they are using Rhino's powerful scripting tools to create organic structures, then interfacing with Ansys for structural analysis. This process was demonstrated through the Sidra Trees project, a 250m long doubly curved steel structure forming an entrance to the Convention Centre at Qatar Education City. Rhino was used in virtually every stage of the design from preprocessing and interfacing with Ansys, to surface smoothening, scheduling, and interfacing to digital fabrication. ***www.simplyrhino.co.uk***

Deltek to give project managers more control

Deltek, a provider of enterprise management software for project-focused organisations, has announced the general release of Deltek Vision 4.1. The new release includes new visualisation and workflow features designed to enable project managers to more effectively analyse their business metrics and streamline operations.

"Vision 4.1 provides our firm with a real-time, precise view into the health of more than 1,000 active projects, allowing us to make critical bottom-line staffing and project execution decisions quickly and accurately," said Bill Deitner, CEO of TKDA, a US engineering, architecture and planning firm ranked among the country's top 500 architecture firms. "In just a few months using Vision 4.1 beta, our firm has already experienced notable time savings and productivity improvements, and we anticipate further gains in business efficiency and profitability." ***www.deltek.com***

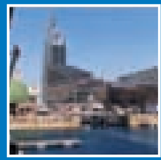
Bentley delivers V8 XM vertical product family

Bentley has announced the new V8 XM Edition of Bentley Structural, the Building Information Modelling solution for the design and documentation of structural systems.

A key feature of Bentley Structural V8 XM is increased structural analysis support, including enhanced interoperability with Bentley's RAM Structural System and STAAD.Pro products. Bidirectional connectivity with RAM Structural System and the exchange of additional structural types with STAAD.Pro highlight the new edition's analysis updates.

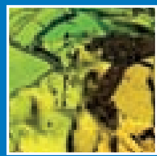
Meanwhile, Bentley has also announced Bentley Building Mechanical Systems V8 XM Edition, for the design and documentation of air-handling and plumbing systems and Bentley Building Electrical Systems V8 XM Edition, which provides for the design and engineering, documentation, and management of electrical power, lighting, fire detection, communications, security, and other building subsystems. ***www.bentley.com***

Bentley announces 2007 BE Conference dates



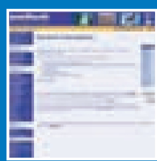
Bentley Systems has has announced that BE Conference 2007 will be held at the Los Angeles Convention Centre in California, April 29-May 3, and BE Conference Europe will be held at the Hilton London Metropole in the United Kingdom, June 10-14. In addition, the company issued a call for presentations for both events.
www.be.org/beconference

Laser eye in the sky models new road from the air



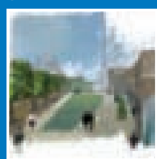
BlueSky has created a detailed 3D map to support East Renfrewshire Council's Road Transportation Service in the construction of a new link road in the Barrhead district to the west of Glasgow. Captured using the LiDAR (Light Detection and Ranging) distance measurement system, the aircraft-mounted laser technology determines accurate heights of land and buildings. The digital data, which provides height above sea level readings every metre with an accuracy of 15 centimetres, is being used to accurately calculate 'cut and fill' volumes in preparation for the earthworks project stage.
www.bluesky-world.com

Excitech looks to add value to Autodesk subscription



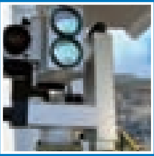
Specialist AEC software solution supplier, Excitech, has introduced new content and services for its Autodesk subscription holders, which will be provided through an exclusive web portal. Organisations that have Autodesk subscriptions through Excitech simply register on the Excitech web site and log in to the new site. Content already includes a Step by Step guide to registering with Autodesk, Web Seminar Recordings, "In Focus" pages for specific products, White Papers, and Software Updates.
www.excitech.co.uk

Informatix to celebrate 10 years with competition



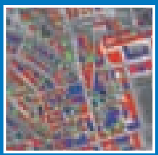
Informatix Software will be ten years old on 25th April 2007, and to celebrate the occasion is holding a worldwide competition for users of its products MicroGDS and Piranesi. Prizes up to the value of £500 will be awarded for images produced using either product. More details of categories, rules, and prizes will be announced in December. Paul Richens, Professor of Architectural Computing at the University of Bath, will lead the judging panel.
www.informatix.co.uk

3D laser mapping helps improve safety at mine



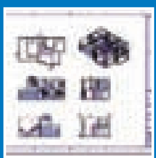
3D Laser Mapping, the Nottingham-based specialist in laser measurement technology, has supplied Anglo Platinum with an advanced solution to improve the safety of operations at the Potgietersrust Platinum Mine in South Africa. The solution uses laser technology to continuously capture accurate slope measurements and sophisticated software to automatically analyse the results. ***www.3dlasermapping.com***

BlueSky maps thermal hot spots in Kirklees



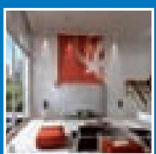
BlueSky, the aerial survey specialist, has produced a detailed 'hot spot' map of nearly every property in Kirklees. The infrared imagery shows the 'temperature' of individual buildings highlighting those with high heat loss. This information will be used by Kirklees Metropolitan Council to identify groups of properties with poor insulation for remedial action and also to meet government targets for increasing energy efficiency and energy conservation reporting. ***www.bluesky-world.com***

Step by step VectorWorks Architect training manual



Nemetschek NA has released Step by Step with VectorWorks Architect, a new training manual written by Steve Hader, which aims to teach a practical approach to project workflow. The manual has been expanded to demonstrate the new tools and technologies found in version 12, including the completely redesigned user interface, Navigation palette, live sections, new building objects, and more. ***www.nemetschek.net***

CADline awarded top level Autodesk accreditation



Autodesk reseller, CADline has been awarded Building Solutions Premier Solution Partner (PSP) status, the highest level of accreditation from Autodesk.

"Autodesk PSPs represent the top tier of the Autodesk Value Added Reseller program," says Pete Baxter, Autodesk sales director, Building Solutions Division. "They excel at implementing Autodesk solutions, providing customers with a full start to finish service, from pre and post-sales support, to training, implementation, and customisation. We are pleased to be able to recognise our top partners through this program." ***www.cadline.co.uk***

BE award puts Oldham on the map

Oldham Metropolitan Borough Council has won a 2006 BE Award for its Integrated eGovernment project. The award category was "Best Overall IT Strategy." The BE Awards of Excellence recognise the work of Bentley users improving the world's infrastructure.

In 1994, Oldham Metropolitan Borough Council (OMBC) initiated an integrated eGovernment IT strategy. Prior to that, all architecture, engineering, and construction (AEC) and geospatial information was either paper- or microfiche-based and stored in disparate databases.

The new strategy aimed to centralise and provide a seamless flow of all AEC and geospatial data related to design, operation, and management. This would eliminate the duplication of data and resources, improve the efficiency of OMBC's operations, reduce costs, and streamline the delivery of services to the public – all of which would allow OMBC to maximise the return on its investment in software, hardware, and user training.

As Peter Taylor, CAD/GIS development officer for OMBC, explained, "Our new strategy provides engineering solutions that allow each department to specialise in its own discipline, yet it also enables information sharing among departments and improves interdepartmental cooperation. The government benefits from improved workflows and efficiencies, and the public benefits from the enhanced delivery of a broader range of services."

OMBC's criteria in selecting a solution to deliver eGovernment included ease of use, simplified administration, instant search and access to data, flexibility in design, and the ability to grow and adapt as requirements change. It was also critical that all 3D AEC models interoperate with the geospatial solution – enabling internal and external developers to visualise their projects in a geospatial context. In addition, the desktop design and data capture tools had to interoperate with other database systems.

Said Peter Taylor, "After stringent testing and evaluation, we determined that Bentley provides the most comprehensive and best-integrated portfolio of AEC and geospatial solutions. The software presents a single and familiar interface to all building, civil, plant, and geospatial disciplines, and allows data and designs created by one discipline to be used by others and form the basis of common workflows."

Use of the Bentley AEC and geospatial solutions in OMBC's eGovernment strategy has expanded over time to include a growing diversity of applications. Currently, OMBC is using 239 Bentley product licenses to support every aspect of design or data management in every department, including environmental services, social services, education, regeneration, housing management, and corporate security. Examples of specific data being recorded and managed include CCT camera locations, sewer networks, employee home locations, public rights of way, cycle networks, contaminated land sites, waste disposal sites, refuse collection routes, highway markings, and building design, construction and management. ***www.bentley.com***

Cyco enhances AutoManager Meridian

Cyco Software, the Engineering Data Management (EDM) software specialist, has released a new version of Cyco AutoManager Meridian, 2006B. The new Global Collaboration Framework (GCF) is now available as an optional module for Cyco AutoManager Meridian. Additionally, the 2006B release offers a new Web Client user interface and improved support for Citrix configurations and supports MicroStation V8 XM (8.09), and Autodesk Revit Building 8 and 9 among others. ***www.cyco.com***

Scottish council looks to online collaboration

West Lothian Council is using BuildOnline's On-Demand document collaboration technology to share plans between internal and external teams involved in overhauling the facilities of two Scottish secondary schools. The Web-based technology has given team members visibility of all new documents, designs and drawings enabling them to access all the information they need at any time from anywhere and ensuring everyone is kept informed of all project progress. ***www.buildonline.com***

Excitech probes adoption of discipline specific design

Specialist AEC software supplier Excitech has announced the results of a survey into attitudes towards discipline-specific design software. An advocate of computer aided design solutions which go beyond computer aided drafting, Excitech is very aware that while some organisations have adopted such techniques enthusiastically and, supported by Excitech, used them on major projects such as BAA's T5, other organisations are not yet convinced of the benefits.

As a result Excitech decided to quantify the key arguments on both sides through a survey. Of the 127 organisations which took part 42% had adopted discipline-specific software, 36% had not and 22% had done so to a certain extent. Key findings included:

- "3D" was both the key reason for (over 50%) – and against (over 60%)– adopting such solutions. This apparently contradictory result perhaps highlights that "3D" is perceived by different people as meaning different things.
- Top benefits gained from discipline specific software, beyond "3D", included visualisation production, better working drawing production, better coordination and faster design changes.
- Top reasons from those not adopting discipline-specific software included that they did not want/need "3D", software cost, concern over complexities and implementation cost as well as being too busy to move.
- Finally, for those who have partially implemented discipline-specific software they were being held back primarily by it not being suitable for all departments. ***www.excitech.co.uk***



Image by: atelier SoA

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Architects adapt to green future



The results of the 2006 Autodesk Green Index, which provides a measure of the adoption of sustainable design techniques by architects, were announced this month. The overall Green Index number, based on a score of zero to 100, is expected to double by 2011, from 30 in 2006.

Seventy-seven percent of this year's respondents indicated that client demand is the top driver for architects to practice sustainable design, up from 64 percent in 2005's Green Index. In last year's survey, customer demand was tied with fuel costs as leading drivers for the adoption of green building practices.

"This year's study reveals a growing commitment by architects and owners for supporting sustainable design principles," said Jay Bhatt, VP, Autodesk building solutions. "By enabling our customers to collaborate more effectively and estimate more accurately, Autodesk solutions help architects predict the overall lifecycle costs of their designs."

In 2005, the American Institute of Architects (AIA) established a goal to reduce building- and construction-related fossil-fuel use by 50 per cent by 2010. More than 60 per cent of architects responding to the 2006 Autodesk Green Index survey predict that their integrated/high performance design work will help meet the 2005 AIA goal.

According to the 2006 Autodesk Green Index, architects expect to expand their use of design software for energy modelling in the next five years for a variety of tasks, including:

- A 300% increase in the use of design software to specify material quantities and schedules to minimise waste during the construction process (to be used by 36% of architects on most of their projects in 2011, compared to 9% in 2006)
- A 258% increase to predict and evaluate solar heating (43% in 2011, 12% in 2006)
- A 176% increase to predict and evaluate solar lighting (17% in 2011, 47% in 2006)
- A 105% increase to evaluate and explore alternative building materials to maximise energy performance and minimize environmental impact (45% in 2011, 22% in 2006)
- A 112% increase to conduct energy modelling/baseline analysis (53% in 2011, 25% in 2006)

The most prevalent energy-saving initiative for architects are high-efficiency HVAC systems, with 64 per cent of the study's respondents specifying their use on more than half of their projects over the past year. Five years ago, only 36 per cent of architects used high-efficiency HVAC systems on over half of their design project; 85 per cent expect to use high-efficiency HVAC systems on most of their projects by 2011.

www.autodesk.com/green

Canon launches LFP upgrade programme

Canon UK has announced a new promotion aimed at customers predominantly in the CAD industry, through the Canon Partner Channel in order to help them share the cost of upgrading to new technology. Selected resellers can offer up to £800 towards brand new Canon printers in the CAD/GIS range, when customers wish to trade in healthy old LFP, regardless of manufacturer.

Meanwhile, Canon UK has announced a partnership with Art Systems, that will see the Nottingham-based distributor take on Canon's large format printers (LFP) and solutions. Canon launched six new LFPs in 2006 including the magePROGRAF iPF600 and iPF700. ***www.canon.co.uk***

Nvidia delivers new performance drivers

Nvidia has posted its new performance drivers: MAXtreme 9 D3D for 3ds Max 9 and Powerdraft 2007 for AutoCAD 2007. The new drivers have been developed in close collaboration with Autodesk and according to Nvidia its MAXtreme 9 driver increased performance up to 100%, while Powerdraft 2007 improved AutoCAD 2007 performance by as much as 73%. Both tests were carried out with a Quadro FX 5500.

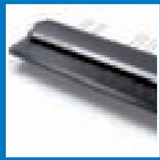
Nvidia's MAXtreme 9 Direct3D performance driver allowing 3ds Max users to control the application's viewport display quality and real-time rendering speed. Powerdraft 2007, a performance driver for AutoCAD 2007, provides 3D hardware acceleration for Quadro FX. ***www.nvidia.com***

Evolve announces CAD manager's survey 2007

Evolve Consultancy has announced the publication of its third annual UK Architectural, Engineering & Construction CAD Manager's survey. It compares the roles performed by CAD and Technology Managers in the UK construction industry. Topics covered include roles and responsibilities, salaries, the number of CAD support staff in relation to numbers of users, opinions on support providers, quality of CAD training, CAD standards and much more.

Participants are invited to fill out the survey online, which shouldn't take more than 15 minutes to fill in, says Nigel Davies, Evolve's Principal. Last year's report can also be downloaded from the consultancy's website. ***www.evolve-consultancy.com***

New wide format scanner web site for CAD users



Softcover, the publisher of Scan2CAD, has launched ***www.scanners4CAD.com*** to provide CAD users with comparison charts, news, views and advice on large format scanners for CAD use, specifically scanning technical drawings for archiving, copying and printing and or raster to vector conversion. The site features a free wide format scanner comparison chart listing 31 different models suitable for CAD work from Colortrac, Contex and Graphtec.

www.scanners4CAD.com

ARTVPS delivers new AMD-based render server



ARTVPS has announced the launch of Render Server, a new network rendering solution which features mental images technology, two dual core AMD Opteron processors and a built-in, custom GUI front-end. The 64-bit Render Server allows users to organise and manage rendering tasks on a network and can be used independently or as part of a dedicated render farm. Meanwhile, the company's new RenderPipe AV5.5 software is claimed to provide a range of improved lighting features and post process image controls, to enable architects to produce natural lighting effects and have greater control over the final images they create. ***www.artvps.com***

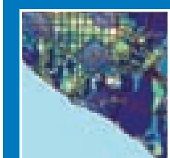
Mayrise supports £3.5m Cambridge Water contract



May Guerney, the integrated support and construction services company, has implemented an advanced software solution from Mayrise Systems to manage street works on behalf of Cambridge Water. In a £3.5 million per annum contract that covers water network repairs, maintenance, metering and renewal, over 3,000 street work notices have already been raised using the system.

www.mayrise.co.uk

MapInfo offers analytical tool for site location



MapInfo has introduced AnySite, a new analytical tool for developing site location strategies. The software has been developed for the UK market to help retail, restaurant, financial services and property decision makers to analyse the relationship between store performance and market trade area demographic characteristics.

www.mapinfo.com

The DWG conundrum

At Autodesk's recent UK user event Martyn Day caught up with Autodesk's CEO, and talked about the Open Design Alliance and the political upheaval that was going on in the management there.

The Open Design Alliance (ODA) is an organisation that is dedicated to reverse engineering Autodesk's DWG file format. Many of Autodesk's competitors pay this organisation a fee and in return they get the libraries that enable them to open and save into a DWG file. The organisation has been very vocal making claims that the DWG file format is encrypted but has managed to reverse engineer it. Autodesk has consistently denied this accusation but admitting that in the last version of DWG (2007), Autodesk did place an encrypted component in the format but this was only to embed a 'watermark'. All this watermark actually is, is an Autodesk copyrighted text string and AutoCAD only uses this to recognise DWGs that were created in AutoCAD and those that were not (without the watermark). Recently the ODA has announced full support for the AutoCAD 2007 DWG file format including writing the watermark, which is potentially a legal issue for Autodesk, should they so wish to take it further, as by the very nature of writing that sentence the ODA potentially infringes a copyright. Bass acknowledged it was a concern but didn't appear to be in a litigious mood.

He told me the watermark was added to AutoCAD because they were finding that support calls relating to corrupted DWGs had a high correlation to Autodesk's technical support finding that these DWGs originated from non-Autodesk products. The watermark lets AutoCAD potentially recognise non-AutoCAD DWGs and AutoCAD 2007 is configured to alert the user that the file that's about to be open is from a non-AutoCAD source. This alert can be switched off. If Autodesk wanted to, it could potentially use this watermark to stop AutoCAD from loading any non-Autodesk DWG file. Bass told me that this was not the intention but some customers were running into trouble when running mixed AutoCAD and non-AutoCAD DWGs. He related a story of an aerospace customer that had one of its teams running IntelliCAD (an AutoCAD-like clone that uses the ODA DWG library). The company experienced consistent DWG corruption and Autodesk tracked down the problem to files that were coming from this team.

Autodesk's view of the ODA is that it's not what it says it is and the ODA message that it exists to assist users in gaining access to their data, seemed to particularly 'nark' Bass. In the past the ODA claims to have offered Autodesk membership, but one of the stipulations is that by being a member you put 'into the pot' everything you know about the AutoCAD DWG file format. Obviously Autodesk knows everything. So what would it get in return? The ODA does have a DGN file format (Bentley MicroStation) product which would be of some interest to Autodesk as it has just paid to reverse engineer this format separately but all the other CAD vendors that are ODA members have no obligation to divulge their file format (SolidWorks, PTC etc.). Bass thinks it would be a useful organisation if indeed all these CAD companies would open up their formats and cross licence each other's libraries.

"Bass views the Open Design Alliance as a company that just reverse engineers for all his competitors and creates tech support queries for his company."

He told me 'I want to compete on product capability, not format'. Bass went so far as to contact the ODA and suggest that instead of reverse engineering DWG if the ODA could get all the vendors to sign-up and agree to openly licence their formats, then he would willingly give them the DWG libraries. He says they declined the idea. Bass concluded that if the ODA were serious about acting for users and pushing openness then a structure whereby they acted as the holder of all the vendors' format 'keys' and monitored the libraries and licensing, then that would be a valuable thing to do. As things stand, Bass views the ODA as a company that just reverse engineers for all his competitors and creates tech support queries for his company.

In an unusual industry move, Bass said that he had recently done the rounds of the main CAD vendors one by one, making them the same 'show me yours and I'll show you mine' file format offer. He said that both Bentley (MicroStation) and Dassault Systemes (SolidWorks, Catia) declined but some had accepted. He told me I'd have to wait till the official announcements to find out who Autodesk has done deals with. I would guess UGS (Solid Edge, NX) and/or PTC (Pro/Engineer WildFire) may be more open to this as in the Product Lifecycle Management (PLM) arena, native file access would be very useful.

Conclusion

In the CAD industry, file format issues are no laughing matter. Proprietary file formats have been one of the key issues in hampering data exchange - in fact a huge industry has been built up servicing engineering firms that send each other data created in different CAD files. It's never said, but CAD companies typically rely on the fact that data is hard to fully migrate between systems to keep users hooked to their programs. In making a switch CAD managers have to take into account the legacy issues that proprietary formats generate.



In the past Autodesk has certainly been very protective of its format and when threatened by IntelliCAD in the early days, ran a very negative advertising campaign, claiming only Autodesk products are 100% DWG guaranteed, as IntelliCAD used a reverse-engineered DWG. When Autodesk introduced the watermark in AutoCAD 2007, which warned uses they were about to open a non-AutoCAD DWG, I must admit that I was very concerned that this was a return to old form but these are different times and Autodesk doesn't seem to be under much threat at all, quite the opposite.

I can see how the offer of joining the ODA seems unfair to Autodesk but I can also see why Bass's vision of the ODA becoming the industry file format keeper won't work either. Trust is a big issue in this highly competitive market and while all vendors may sign up for such a deal, under tough competition, I'm sure companies under threat would drop out as they would not want their competition to have such easy access to their customer's data. If we were free to move between CAD systems like choosing a Web browser, that would make for interesting times! Also, the ODA provides DWG capability to many companies. If it stopped reverse engineering DWG, and Autodesk were to provide its own libraries, should something happen and Autodesk pulls out of the deal, then there would be a big engineering job to catch up.

The other thing that is probably hampering Bass's aspirations to break the format log-jam is that of Autodesk's own success. Autodesk's growth is amazing in the industry. It is heading rapidly to be a $2billion company. Over the last three years it appears to have woken up and become much more active in developing new products and taking on big new markets. When an 800lb gorilla comes knocking on your door to swap formats and you know they have the resources to eventually overrun your market, if they should so wish, you'd have to have considerable confidence in your product and development team to stay ahead of the game.

www.autodesk.com
www.opendesign.com

Stop press

Since this article was written Autodesk has filed a legal action against the ODA. The action is based on trademark infringement related to Autodesk's DWG watermark and on unfair competition by the ODA's latest DWGdirect libraries, of which Autodesk is requesting that the ODA stops distribution.

Interview: Huw Roberts, Bentley

AEC Magazine's publisher, Martyn Day, managed to get some talk time with Bentley's Global Marketing Director, to get his opinion on BIM, IFCs and current vents in the industry.

Martyn Day: *There has been a radical change in the interface of MicroStation. How has this altered the building vertical products that are based on the new version?*

Huw Roberts: These new versions of Bentley Building benefit dramatically from the new XM 3D interface. There's also a load of enhancements to the vertical products functionality and easy of use, as we use the task-based interface to great effect. So, there are some domain specific changes to the interface that are contextural in nature, they change with each discipline too. This simplifies and organises the design process for users.

If a company has a particular way they want to design in one for the disciplines, they can develop their own or modify the product to match their workflow or standards. With XM, the interaction with the software has been made much simpler, which is good. If you look at Bentley Architecture or Structural, or any of the Bentley verticals, in relation to Autodesk's Revit, Revit is easy to use and understand and navigate but kind of falls down when you go beyond its capabilities, which you do fairly quickly. The flip-side is that the MicroStation-based applications can pretty much create anything you can think of, but they are hard to get up and get started on.

I think the new MicroStation interface, the new task based-design and heads-up technology, radically addresses that. It's basically a whole new interface for our vertical products.

The second thing is that while our integration between all our applications is already pretty good, that's improved again, with a lower entry point for document management. We have bought a number of analysis companies and are continuing to develop partnerships with other analysis products in all the disciplines and we have also increased our support for IFCs up to 2x3.

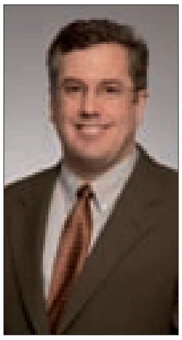
MD: *Autodesk has been talking a lot recently about IFC compliance in Revit and the decision of the General Services Adminsitation (GSA) to require submittals in IFC format. What's your take on Interoperability?*

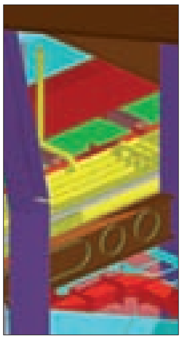
HR: The differences in approach to IFCs really reflects the differences between the companies.

Interoperability is basically the ability to take information from software, one datasource, one person, one activity to give to someone else in a way that they can use it for their own purposes and maybe bring it back. So, it's an exchange based approach. You should be able to do that in a predictable and managed way. Now that's good and has been very important to Bentley for a long time, but don't mix with that the concept of integration as integration is better than interoperability, because 'interoperable' is only a snapshot of your data from your native environment and giving it to someone else as a reflection at some point in time as to where you were. All those exchanges have to be managed and synchronised and, whichever way you do it, you are working in a disconnected way.

In an integrated workflow you can act on and work with the information as it appears. In the Bentley BIM applications, if you are an architect working with a structural engineer and a building services engineer, obviously you are all using Bentley applications to do that and working on your own data but all that information is shared, viewable and editable (within reason) by anybody on the team using those applications. You can actually fire up Bentley Architectural, Structural, Mechanical, Electrical all at the same time, within one session of MicroStation or use reference files and all the data and information is accessible. They all speak the same language.

The support for IFCs that Revit has, is really only a small part of the definition. The General Services





Administration (GSA) here in the US (a government body) required that preliminary designs came with an IFC model and that was really just spaces and a few other elements, it's not a very robust model definition at all. What Autodesk has done is included an export, and only an export, and include only that definition. Autodesk has no IFC for structural, mechanical or details of architectural design and they don't have IFC import. We offer the full definition of IFCs in all of our building disciplines.

The IFC as a technology means of interoperation is now getting pretty good for exchanging information and there are lot of downstream analysis tools that can use the IFCs now, so it's become a really well adopted technology and that's really good for the industry, no one software vendor can dominate. The latest release has really taken it to another level. And the IAI has gotten really smart about promoting it to the architects and their whole 'building smart' campaign has taken their message, made it less technocratic and more understandable.

MD: *I was quite amazed to see the demonstration of Autodesk Revit Structural running as a separate database to the Architectural Revit model. I thought the whole idea about BIM was about a single database?*

HR: I actually think it's hilarious. Autodesk talks out of both sides of its mouth. On one side they say, the only way to do BIM is to have a single database. Revit's whole concept is that you all have to be in one database and the only effective way to access that database is through that tool. So, you can't deal with a Revit Building model and have it aggregate information from various sources, like AutoCAD, MicroStation and SAP and Excel. Yet at the same time, if you are talking about another discipline, like mechanical, there's a separate database and you can't put the two together

anyway. I think they are finding that the federated model is the only way to go - a distributed team using different tools, running different information sources. There's a whole lot of information that's needed in buildings that has nothing to do with CAD.

MD: *So what's happened to the Single Building Model concept?*

HR: I think the industry is a victim of old marketing. The notion of a single building model is because people want a place to go where everything is correct and up to date; everyone who needs to get to it can get to it. How that's technically managed, whether that be one file, or a number of federated files, isn't really what people care about, it's the result. I think in order to achieve that, the 'SBM' or whatever you want to call it, it has to be a federation of databases, files, sources and connections to support the nature of the industry.

In our Bentley architecture you can do everything in one file if you want to – that's a single building model, and it can get huge. That's the approach Revit takes. What happens if you are in different cities? What if you use different tools? It has to be federated and you can do that with our integrated tools.

MD: *Autodesk is quoting some serious numbers for Revit sales, upwards of 140,000 seats?*

HR: You have seen that game before, the Revit Series, is a bundle of AutoCAD and Revit. I think that's what that is. They are including educational in there too. We could do the same thing but throwing in all our seats but that's not a useful fact, it's not realistic in the market. There are firms that have been doing BIM very consistently and proving the technology, like BDP and Whitby Bird in the UK and the rest of the market is doing it at a slower place. Almost everyone is looking or investigating BIM. There is virtually no demand that doesn't at least have a pathway or roadmap to BIM. A lot of companies are realising that a move to BIM is a change, it's all about the discipline specific capabilities.

Everything that we can see is a neck and neck race in BIM, between Bentley and Revit. We have some AutoCAD users coming over when they go to BIM and in fairness we have some mixed shops that are trying Revit too. But we have Revit customers coming to us after they used it, and they didn't like it so came over to our side of the house. There is a horse race in BIM and it is us two. Graphisoft seems to be looking at the construction space, their worldwide marketshare is less than 2% now, but the CEO there, Dominic Gallello is doing a good job, he's turned them around and is finding new outlets for the company.

We have a lot of online resources and we are pursuing events and activities where we can tell the story and that's working. Our BIM applications are accelerating and it's getting out there to the AutoCAD base.

MD: *Bentley has purchased a number of solvers and analysis packages for structural design over the years. Autodesk's recently purchased its first, a French analysis company called Robobat. What's your opinion on this?*

HR: The notion of using BIM and tying it into analysis is one of the great payoffs of the approach. I think it's interesting because Robobat is a French company that is well adopted in France and Poland, a little bit in South East Asia and South America, but almost not on the map in North America. It's fairly high-end analysis for purists, it's more like STAAD, it can handle the complex stuff well but not a great match for your typical structural engineer, doing concrete masonry and steel.

It's interesting that Autodesk bought them. We are guessing Autodesk will probably fold this into Revit Structure and it's clear they were having trouble with the links between the program and the analysis applications. If you look at how the links work, Revit Structure doesn't have sloping columns, sloping beams, connection types, so the analysis programs don't know what to do but there's nowhere there to put it. I think both sides were having a lot of frustration, so Autodesk wanted to bring some of it in-house.

I know Autodesk makes the pitch that structural engineers use lots of different applications and Revit Structure is a common interface but I think that's off track. Structural engineers in general, 'don't do CAD'. There are engineers that do analysis and design and then there's production teams that do the documents or model work. Engineers use STAAD etc and they are thinking about totally different things.

Revit structural is clearly oriented at making a drawing. They are tying to get into the Structural engineers through the documentation space, we are going through the tools that the actual engineers use and connect those to whatever is required, that's more of a reflection of what engineers want and how they work today.



MD: *AEC Magazine is a bit of a fan of Bentley's Generative Components (GC). How could GC technology impact BIM?*

HR: The connection of GC to the rest of our vertical programs is really strong, thanks to the underlying architecture of the XM version. GC is now closely integrated with BIM applications, so the model being manipulated by GC could be a Bentley Structural model or a Bentley Architecture model, not just 'dumb' geometry. So you could have a GC design that is changing the curve of building and heights of floors and is also driving the steel frame. This could be linked to analysis programs so you know what impact your changes had on any of the disciplines. You could have the rules of GC linked to a discipline specific rule, other than just geometry. Some of those constraints might be structural properties of the material or size of glass panels you can buy, so with BIM, that takes you beyond form finding to making real construction decisions by using GCs. There's already a generation of users out there using it on real live projects. ***www.bentley.***

Autodesk Impression

It's not often that Autodesk gives away the first version of a new software application. With Autodesk Labs, the company is attempting to give any designers a chance to test possible future products.

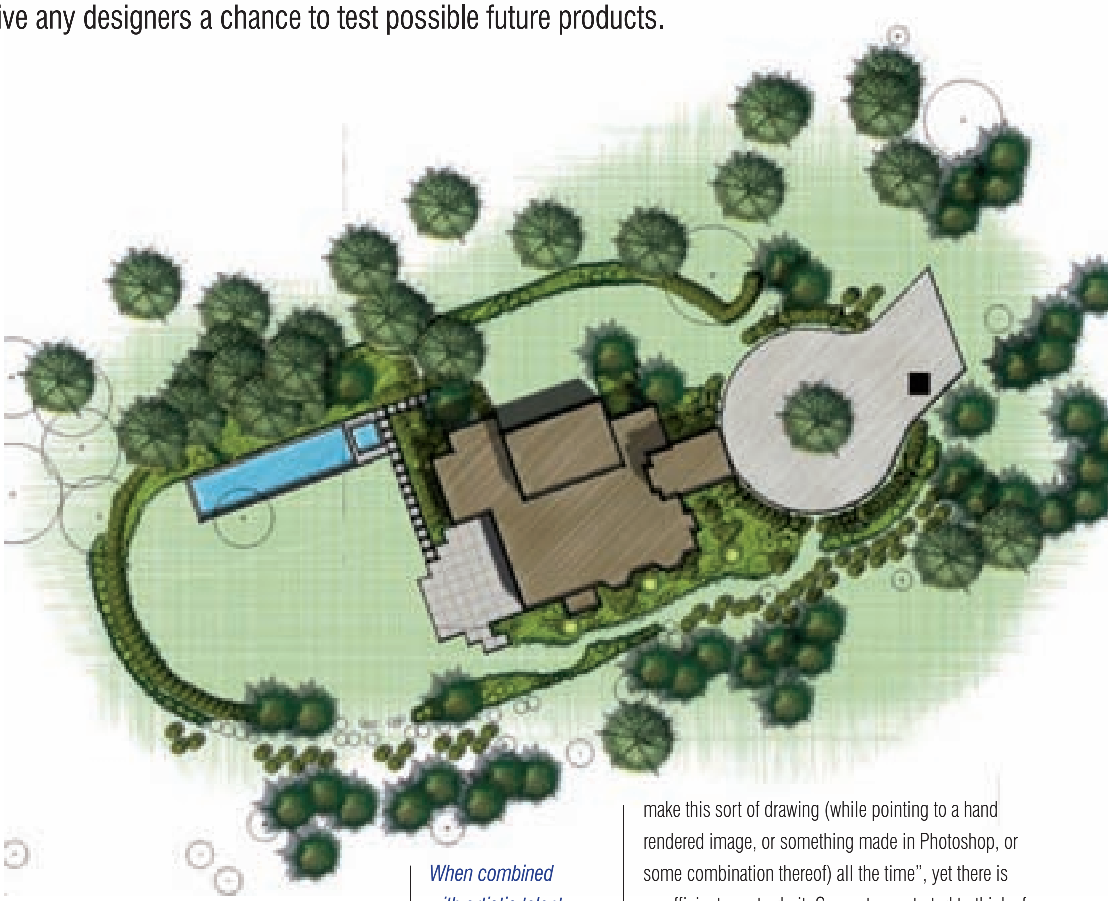
Historically speaking, Autodesk has tended to be a secretive company, rarely telling folks what's in the next release of AutoCAD, let alone openly displaying new code streams or product ideas. In the last couple of years this approach to product design seems to be changing, and changing quite radically.

It's hard to say if Autodesk is developing more products than it used to, as these were kept internal or secret before they shipped or were dumped. However, it does look like Autodesk is more active than ever in seeking out opportunities to develop solutions to problems in all the vertical areas that it addresses (MCAD, AEC, Infrastructure etc). While in the past the company has nearly always tended to come up with an AutoCAD-based solution, it seems that standalone new products are just as viable, if that's what is required. The success of non-AutoCAD products like Inventor and Revit have certainly done a lot to help Autodesk become less reliant on AutoCAD, and with CEO Carl Bass at the helm, this movement looks set to continue, although with an approach to letting engineers and architects experiment with pre-release and 'test' utilities and be a part of that product development process.

Autodesk Labs (http://labs.autodesk.com) is a new website where all the divisions of Autodesk can place these prototype programs, utilities and functions for free download, to let anyone test it out. If you were to visit there today you would already find at least six products on offer, ranging from a Google Earth plug-in to full product downloads.

The concept behind Labs is that Autodesk can put out unsupported code for users to experiment with and give comment or make suggestions. This information is fed back into the product's design and at some point in the future the code may appear in a shipping, pay-for, product. Then again, it may not! Having watched Autodesk for a long time now, this is really quite a radical departure from how products were developed





before. It seems companies like Google have led the way by opting for these big public test sites to see how technology may be used with customers judging how useful or capable the products actually are. This allows Autodesk to release a more robust and feature rich first release.

Impression

While there are a number of applications on Labs, probably the most 'complete' and functional application is something called Autodesk Impression. Impression is a post processor for DWG files that allows designers to quickly produce hand sketched/painted output. It uses CAD elements like blocks, lines and layers to identify areas to be coloured/filled, sketched and populated with graphics elements. Should the DWG be changed, Impression applies the same graphics recipe to the edited CAD file and the image will update automatically. This makes it easy to keep consistency and rapidly speeds up productivity. It's kind of difficult to explain but easy to use and I promise you will have a lot of fun when you download it.

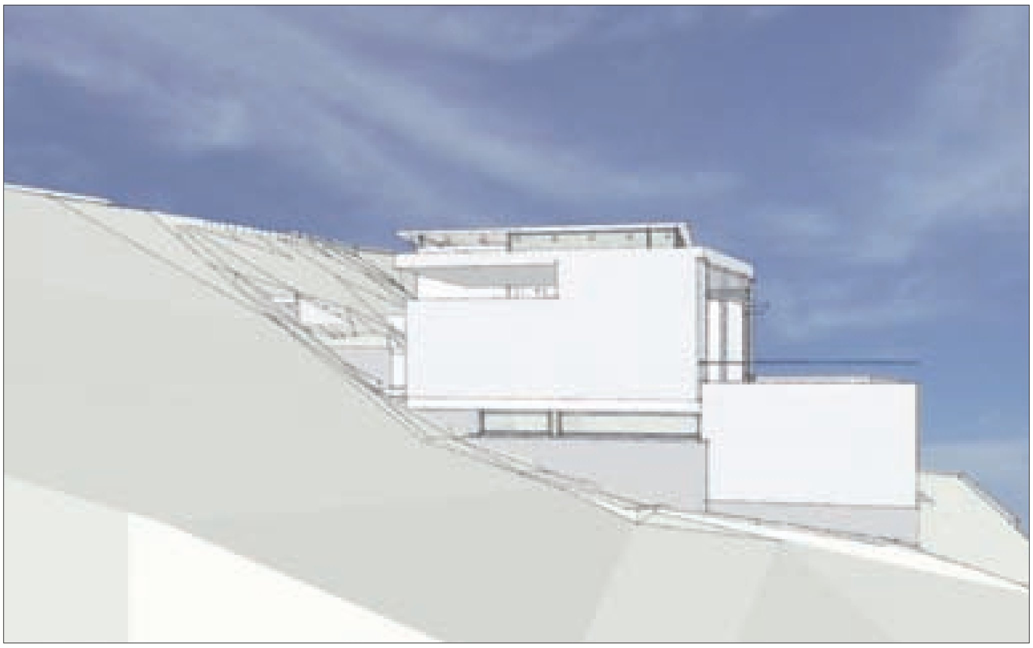
So how did the product come about? I asked Lisa Crounse, Product Marketing Manager at Autodesk. She replied, "The original idea for Impression came from our customers. Often they would tell us, "we make this sort of drawing (while pointing to a hand rendered image, or something made in Photoshop, or some combination thereof) all the time", yet there is no efficient way to do it. So our team started to think of how to solve that problem.

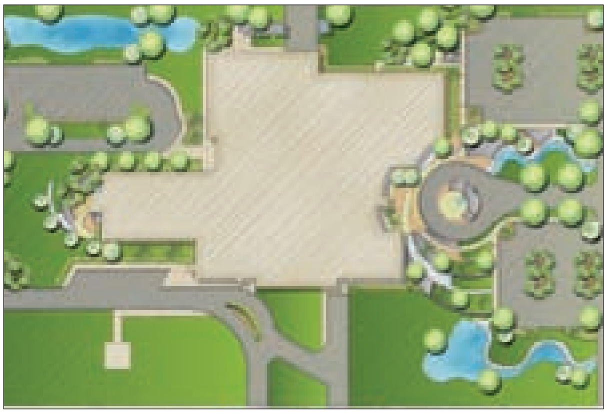
When combined with artistic talent, Impression can achieve some truly stunning results

"Designers need to communicate designs in many settings. Sometimes all that is needed is a CAD drawing. While this is perfect for a technical setting, other times they need a fully rendered 3D image. This is appropriate when they want to show materials, finishes, and the effects of lighting. However, there are many times when neither image is appropriate. The CAD drawing doesn't really engage the imagination. A photorealistic visualisation is also highly specific, albeit in a different way. For many situations it has too much information.

"Many times our customers need to give an impression of their designs without overloading the image with either technical detail or materials and



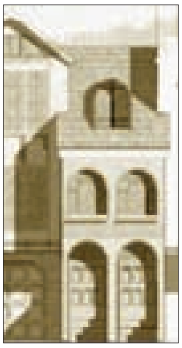




finishes. They need to give an impression that is more stylized or artistic. This is particularly true when the design is still in development and many of the details haven't been resolved. Right now there is no easy way to create these images. That's where Autodesk Impression comes in."

It's true, many customers use Adobe Photoshop and a mixture of other image tools to generate views, or may even plot out the CAD drawing and draw by hand over the top. While the end results are good, what happens if the design needs to be changed or the client wants a number of options? In the traditional process all this work has to be done again. Autodesk assembled a 17 man (guess that should be person) team to come up with a solution to this problem. The key features would be high quality output, easy to learn, fast to use and the product should embrace and assist when the design changes. The result of just over a year's work is Autodesk Impression, a possible future product that leverages the CAD elements to guide the program to create some quite stunning artistic output. Although I will add at this point that talent is not included in the box and I have found it's easy to produce something that does look really bad just as well!

Impression offers standard illustration concepts like pencils, markers and washes. It uses the underlying CAD geometry and objects to apply these (drag and drop) to quickly create an artistic



Impression uses CAD elements like blocks, lines and layers to identify areas to be coloured/filled, sketched and populated with graphics elements.

representation. The interface of Impression is quite simple and has four basic tool palettes, Selection and Draw (create text etc), Layers, Styles and Blocks. The Layers dialogue shows all the DWG layers that are in the DWG file and layers that have been created in Impression. Here you can do the usual freeze, thaw, display etc. or simply drag a style on and drop it on a layer to allocate a style to a layer. The Style dialogue come with a fair few standard options (gradient fill, pencil etc.) and here you browse until you find the style, texture and colour of the one you want to pick, then either drag or drop on a layer, or drag and drop on an object in the geometry. The Block dialogue displays all the active blocks within the drawing, as well as all the substitute options, such as tress, cars etc. With blocks it's really fast to substitute the CAD geometry for a graphic of a tree, it will appear at each instance and it's possible to pre-set some variation so they don't all look the same. The CAD linestyles can also be replaced with artistic variants over which you have a lot of display control. These are reminiscent of those old standalone plot processors that generated 'shakey hand/sketch look' line art.

When used in combination with some talent, it's possible to get some pretty stunning results, as I think the images here will testify. The extra benefit is of course that the whole combination of artistic application can be saved as a 'style map' and replayed over iterations of the design, or even different views. So once you have set up the North Elevation, the style map can be applied to any other view which uses the same layering and object standards, assisting in consistency and saving lots of rework.

Of course it's also possible to make your own content and styles and here Autodesk has provided a powerful tool to do that. Once you have played with the styles that come with it I dare say you will become familiar with using the creation tool palette, where it's really possible to develop your own style or assist folks in you company conform to your in-house style. I think there may be a danger that people will think that because this is software and could automatically batch process files that the output will look the same, for all users, but there's more than enough configuration options and individual approaches out there to ensure that this doesn't happen.

Power boost

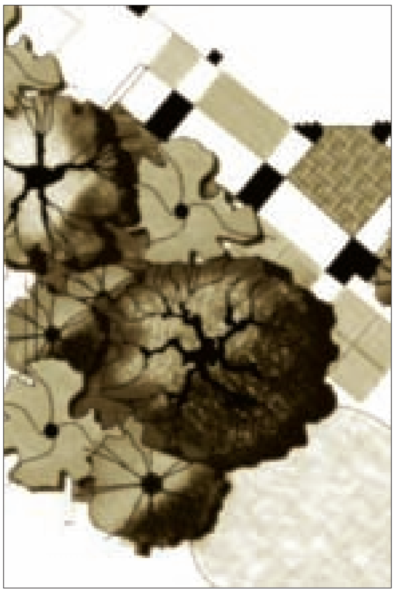
Prior to running the application there's a handy utility which tells you if your system is man enough to run Impression and it does have some specific requirements. Lisa Crounse of Autodesk explained, "The system requirements for Impression are very similar to what we recommend for using the conceptual design tools in AutoCAD 2007 with the exception of the graphics card. Impression requires a graphics card which supports pixel shader 2.0. Interactive responsiveness is really important to our customers and historically, Autodesk makes every attempt to make our products perform as well as possible. To provide that level of performance with the rendering effects in Impression we need a bit more graphics horsepower. Ironically, the illustrative rendering which seems to hearken back to an earlier era is much more computationally intensive than typically computer graphics rendering."

Conclusion

Autodesk is keen to point out that Impression may not ship as a product in the future, as it is a technology demonstrator. And as such isn't supported, so there's no help other than what comes with it. In return for using it, Autodesk wants feedback, but other than that is giving the software for free. The application will be updated on Labs from time to time, with Autodesk already working on release 3! According to sources at Autodesk, despite the product being up only a few weeks, it has generated almost 10,000 downloads.

Impression will be ideal in Landscaping, Architecture and some elements of MCAD. I'm pretty sure this will make it into some product at some point, the benefits and quality of output are just too compelling. I'd highly advise a download.

http://labs.autodesk.com





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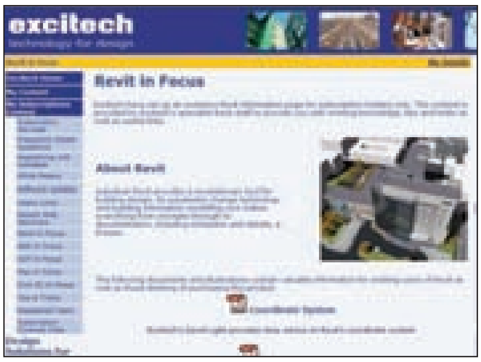
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Autodesk

Making light work

There are a whole host of approaches to lighting indoor spaces, which all have relative strengths and weaknesses. In the first part of a four-part comparison of these interior lighting methods, Darren Brooker walks us through lighting in conjunction with radiosity rendering.

There are many approaches to lighting an indoor space in CG and if the results are aesthetically pleasing then the means by which the output was produced is largely irrelevant. However, given that the differences in the capabilities of the different approaches are reflected in differing render times; knowing your way around these different methods can be invaluable in a production environment.

Within this series of articles, we'll look at a range of approaches to lighting, starting here with radiosity rendering, which can produce stunningly realistic results. However, the flipside of this realism is the time that these renders require to calculate the radiosity solution. Furthermore, if you have moving objects within your scene, this makes this technique fairly unusable, as the radiosity solution is constantly changing and therefore needs to be calculated for every frame. There is a workaround for using HDR maps to relight the moving elements within this type of scenario, but you'll have to wait until next month for this, when we move onto global illumination with mental ray and HDR lighting.

Radiosity has its roots in thermal engineering research, before its methods for simulating radiative heat transfer between surfaces was reworked by computer graphics researchers, twenty years later, in the early 1980s. This process of modelling light propagation involves dividing the original surfaces into a mesh of small elements. The radiosity algorithm calculates the amount of light distributed from each mesh element to every other mesh element. Nonetheless, radiosity does not in fact address all global illumination effects, but as it excels at rendering diffuse inter-reflections and raytracing excels at rendering specular reflections, the two complement each other perfectly. After the radiosity solution has been calculated, a two-dimensional view of it is rendered, with raytracing adding the effects

"The process of modelling light propagation involves dividing the original surfaces into a mesh. The radiosity algorithm then calculates the amount of light distributed from each mesh element to every other mesh element."



that it is particularly suited to providing: raytraced shadows, and materials that feature raytraced reflections and refractions. The final render thus combines both of these techniques in an image that appears more realistic than either technique alone could manage.

In order to understand the workflow for working with radiosity in 3ds Max, it makes sense to take a look at how radiosity is processed by the application, which is a three-stage process. Open the **01Radiosity.max** file and within the Advanced Lighting tab of the Render Scene dialog, select the Radiosity plug-in from the drop-down. Near the top of the options appearing in this panel, you'll now see the Initial Quality setting, set to 85%. This is the first stage of the refinement process that involves the distribution of diffuse lighting in the scene.

Between each iteration, the radiosity engine measures the amount of noise that was computed between surfaces, with the contribution to the scene's average brightness decreasing logarithmically between iterations. An Initial Quality setting of 100% would provide a 100% accurate energy distribution, but this would not be 100% in terms of the visual quality of the solution. A setting of 80 - 85% is usually sufficient for good results, so leave this setting as it is and hit Render. You should get a really blown-out result, which is because you need to use the Exposure Control to compensate for the dynamic range of radiosity rendering. Hit the Setup button further down the same rollout and choose Logarithmic Exposure Control.

If you render now, you'll see that the exposure looks correct, but that there are noise and geometry issues, as you can see in **figure 01**. This is dealt with by the second refinement stage – Refine Iterations. Due to the random nature of the sampling during the previous Initial Quality stage, some of the smaller surfaces or mesh elements in the scene might miss being hit by a sufficient amount of rays. These small surfaces remain dark, and result in the appearance of dark spots. To alleviate these artefacts, the Refine Iterations stage 'regathers light' at every surface element. Change the Refine Iterations (All Objects) setting to 2 and set the Indirect and Direct Light Filtering to 3 and 2 respectively. You should see that your render now takes next to no time to complete and there's a definite improvement in quality, though some geometry issues are still apparent, as you can see in **figure 02**.

To deal with these topology-related artefacts, which often appear as shadows or light leaks, a third refinement stage, known as Pixel Regathering,

Radiosity rendering at a glance

Positives:

1. Solution only needs calculating once for multiple cameras.
2. Simple to set up, once the workflow is understood.
3. Can provide beautifully realistic warm and soft results.

Negatives:

1. Does not address all global illumination elements (caustics are only dealt with by mental ray).
2. Solution needs recalculating if objects moving in scene.
3. Slow to calculate.

Tips & Tricks

- Always check your system units.
- Use photometric lights to represent real-world fixtures.
- Use the Exposure Control to account for high dynamic ranges.
- Turn on Reflectance & Transmittance Information in Preferences.
- Design your materials carefully, in line with real-world materials.
- Work with white materials initially to define your render settings.
- Introduce curved objects to help define your render settings.

Radiosity rendering in three stages



Figure 1 – ***After the initial run, 'Exposure Control' makes the initial exposure looks correct, but there are still noise and geometry issues.***



Figure 2 – ***In the Refine Iterations stage light is 'regathered' at every surface element and there is a definite improvement in quality, though some geometry issues are still apparent.***



Figure 3 – ***Final production quality rendering is achieved in the third, Pixel Regathering, stage.***

occurs at the time of image rendering. This involves a final regather process for each pixel of the image, which can add a fair amount of time to the rendering of a final image. To see this, turn on Render Direct Illumination in the Rendering Parameters rollout and render again. You'll see the difference this makes to your render time, but also your final rendering. There are still artefacts, in the form of light leaks, but you should see that this solution is almost there. If you want to look at the final render settings for this scene, open 01RadiosityFinished.max, where you can look through these rollouts to see what else is required to get to a final production quality rendering standard, as shown in **figure 03**.

Now that you understand what determines the quality (and render times) of a radiosity render, you should open the **01RadiosityExample.max** file, which is all set up to render at final render quality, just like our main image. If you look at the render settings for this scene, you will see that they are identical to the final quality settings for the previous scene file. However, this scene is more complex and this is the scene that we will be relighting each month using different methods in order to compare render times, output quality and any particular strengths and weaknesses.

Things to note are that the interior lighting uses photometric lights, which use a pre-defined photometric web that is a 3D representation of the light distribution of a light source. Many lighting manufacturers provide web files that model their products, so particularly if you are visualising a space that is to feature specific light fittings, this is something you should take advantage of.

A related thing is to ensure your scene's units are correctly defined. As radiosity works with physical lighting, so the lighting simulations obey its physical laws. You can imagine that a three-metre high space will look quite different to a three kilometre high space when lit by the same light fittings. The Units Setup dialog should be used to ensure that this is being dealt with correctly. The System Unit Setup is the most important component of this dialog, as the Display Unit is just a tool that lets you customise how units are displayed in the UI. Setting up units correctly is particularly important if you are importing geometry from another application.

Another thing to ensure is that you are designing your materials in line with their real-world equivalents. The best way to do this is to make sure that you have the Reflectance & Transmittance Information turned on in the Preferences. This allows you to see how reflective your materials are within the Material Editor. For example, a white paint material should only have a reflectance of about 80%, so by turning on this feature, you can ensure that your materials behave as their real-world equivalents would.

All of these tips will equip you well for rendering with both radiosity and mental ray, as well as with HDR lighting, so these fundamentals are good to remember early on. Next month we'll continue with global illumination, this time using 3ds Max's second renderer – mental ray – and we'll start to take a look at rendering out floating-point HDR maps in order to relight additional scene elements.

Downloading the tutorial files

Visit **www.stinkypops.co.uk/aecPt01.html** to download a zipped archive of all the scene files and textures that you will need to complete this tutorial. Unzip them to your chosen location on your hard drive.

"Many lighting manufacturers provide web files that model their products, so particularly if you are visualising a space that is to feature specific light fittings, this is something you should take advantage of."

Darren Brooker is a BAFTA award-winning lighting artist who has worked at many top UK studios. He works for Autodesk as a product specialist. His book, Essential CG Lighting Techniques with 3ds max, is published by Focal Press ***www.focalpress.com***

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Project: One Blackfriars Road

Architect: Ian Simpson Architects
(www.iansimpsonarchitects.com)
Software: Bentley MicroStation V8; Engineering Configurations; Generative Components ***(www.bentley.com)***

One Blackfriars Road is a proposed new landmark building for London. The scheme contains a 375 bedroom 6* hotel, 120 residential apartments and a publicly accessible sky deck. These elements are integrated into a slender, sculptural 65-storey tower and six storey podium building which frame a landscaped plaza.

MicroStation was used for exploring the geometry of the form and producing the visualisations for client and public presentations.

The shape of the tower is defined by a series of vertical curves that are assigned differing radii. At each level the floor is defined as the shape formed by connecting the resulting ellipses tangentially. This parametric definition of the form has meant that different solutions could be produced quickly and the resulting floor areas quantified. A mix of Generative Components and MicroStation VBA was used to generate the different versions of the tower based on the rules and compute the resulting floor areas. This allowed many more options to be explored then could otherwise have been attempted.

When an option was chosen for detailed study, cladding and window panels were added to each floor plate. Again VBA macros were used to assist in this process. The resulting model was then used for visualisation studies, which were critical since this building will be a very prominent feature on the London skyline.

Handling large volumes of complex geometry from early parametric studies through to a render ready model was central to this project. As a result Bentley's integrated software environment was a key enabling technology in this development process.







The shape of the tower is formed by a series of parametric vertical curves, which define each floor shape. This parametric definition of the form has made it easy to explore a whole variety of different design scenarios.





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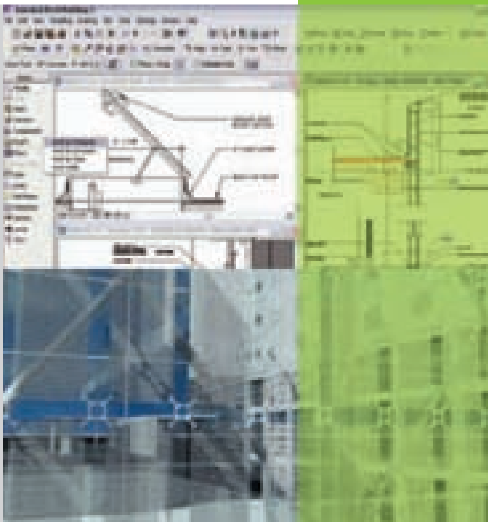
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Building Regulations, Part L

Part L of the latest Building Regulations, which came into force in April 2006, is designed to cut carbon emissions by at least 20 per cent in dwellings and 27 per cent in other buildings, compared to the previous 2002 regulations. AEC Magazine discusses the implications for the building industry with CADline's David Payne, product manager for Cymap.

AEC: *How big an impact will the new Part L have on architects and building services engineers?*
David Payne: This drive to improve energy efficiency in new building design provides a real challenge for the whole building industry. In particular, it will have a profound effect on the traditionally 'arms length' relationship between architects and engineers. Historically, individual products supporting the industry have tended to be developed autonomously. In meeting the demands of this new market however, we have recognised the need to bring together the best technologies to provide an integrated, end-to-end solution designed to speed up the design process.

AEC: *How would you describe the architect/ engineer relationship?*
DP: in the past, the architect has been able to complete a design in isolation and then pass it to the building services engineer to design and add in the required services. Where a design has been less than efficient, the engineer has been able to solve the problem at this late stage by, in effect 'throwing bigger or better services at it' in order to ensure compliance.

Under the new more stringent regulations however, engineers will no longer be able to correct an inherently non-compliant design in this way and will need to be involved earlier in the design stage. Whilst architects will have the greatest impact on whether or not a building meets the demands of Part L, the prominence of the engineer will be raised along with the need for better communication between the architect and engineer.

In future, architects will need to work much more closely with their engineering counterparts from the initial concept development of a project to avoid the risk of months of abortive design work with potentially disastrous implications on building costs and the imposition of penalty clauses for late completion.

AEC: *But does the industry recognise the need for change?*
DP: As a provider to the industry, we are convinced of the need for an integrated approach. It is encouraging to see, therefore, that closer collaboration is starting to happen in practice, with positive results. Indeed, we have already seen some architectural practices working closely with consultant engineers to check building services and Part L compliance and we are working hard to help bridge this gap from both a technology and support service perspective.
Yet in order for the two groups of professionals to communicate effectively, their respective design software must also be able to 'talk to each other'. In order to make this happen, we are using our experience of both architectural design and building services automation software to develop a fully-integrated, end-to-end software solution.



Solar facade of a skyscraper: with the new Part L Building Regulations, there needs to be closer cooperation between architects and building services engineers.

AEC: *What does such an integrated solution look like in practice?*
DP: Our goal is to bring together three key software products in Cymap, Tas Building Designer and Autodesk Building Systems (ABS). CADline's Cymap building services design solution, for example, offers mechanical and electrical modules and can be used for all forms of commercial & domestic property, both new builds and refurbishments.

It provides comprehensive solutions for heating, cooling and energy consumption, piped and ducted services, and low voltage wiring and lighting design and can be used at all stages of the design process, from initial conception through scheme design to the production of working and as-built drawings. By enabling users to perform both routine and complex calculations associated with heat loss, heat gain and energy consumption at each stage, Cymap allows engineers to improve both productivity and design accuracy.

Next, Tas is a suite of software products, which simulate the dynamic thermal performance of buildings and their systems, enabling users to compare alternative heating/cooling strategies, energy demand and check designs for Part L compliance. The main module is Tas Building Designer, which performs dynamic building simulation with integrated natural and forced airflow.

And finally, ABS provides a building design and construction documentation application for mechanical, engineering and plumbing design and construction professionals based on the AutoCAD software platform – and in looking ahead to 2007, Revit Systems – enabling designers and drafters to improve accuracy, productivity and co-ordination.

AEC: *How important is improved communication in making this happen?*
DP: In a word, essential. As stand-alone solutions, Cymap, Tas and ABS each deliver powerful productivity benefits, yet by looking at the bigger picture and bringing them together, we aim to make compliance easier and project delivery smoother and more cost-effective.

To achieve this, Cymap is already linked with Autodesk's ABS software and we are well underway to achieving similar collaboration with Tas. The underlying objective is an industry first - to provide intelligent, two-way dataflow throughout the design process, so removing the need to input data more than once which in turn will improve accuracy as well as saving time and money.

By communicating in this way, not only will it ensure compliance but also make design intent communication between the architect and engineer easier and speed project delivery. In short, an integrated approach will make the whole life-cycle of project management more efficient.
As ever, it's good to talk.

CADline is a leading building services and design solutions consultancy and Autodesk UK Premier Solutions Partner ***www.cadline.co.uk***

3D detailing – the future?

At a recent Revit User Group meeting staged by Excitech a comment by one attendee kicked off a discussion which has continued since. The question raised was "why don't we detail in 3D?"

Excitech's Revit User Group meets to discuss and exchange ideas about how they are using one of the most innovative building design software tools – Autodesk Revit. The September meeting included a presentation of "Tips and Tricks" including one on "architectural detailing with Revit". Doug Bevan, Technical Director at Halcrow immediately asked why we all assume detailing should be in 2D. "Surely", he said, "if we have a 3D model then we can make clearer the design intent with detailing in 3D". Alan Ogden, an Associate at Arup agreed and pointed out that if companies like IKEA see the need to explain assemblies in 3D to ensure their furniture is built correctly then maybe we should be exploring this within the construction industry.

The 2D/3D challenge

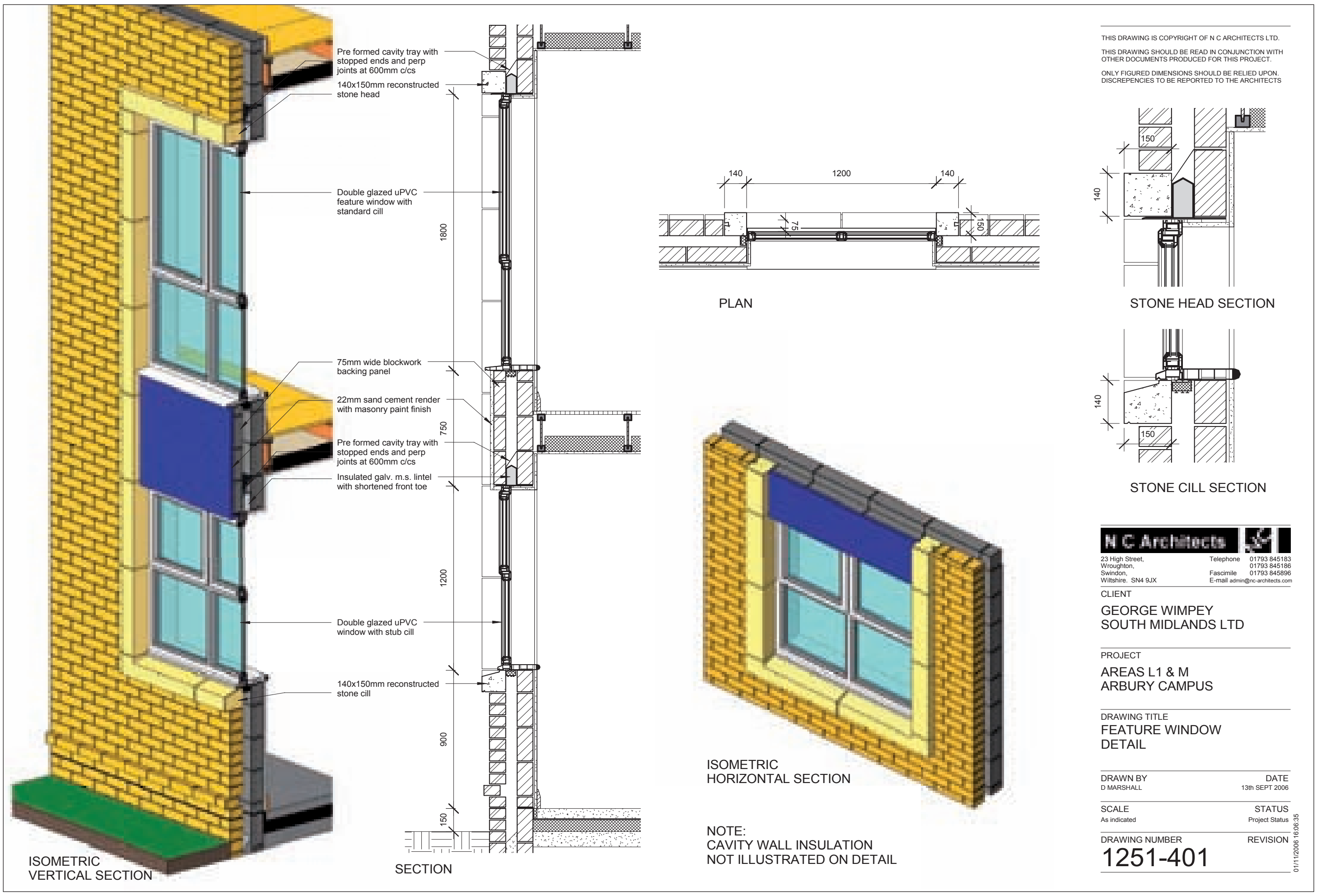
According to Doug Bevan when design was prepared on drawing boards nearly all drawings were composed of 2D views. 3D views were occasionally produced but because they were time consuming they were only undertaken to communicate complex assemblies. With the advent of computer aided drafting, the status quo was maintained as computers did not have the necessary power and we maintained the focus on 2D output. As PCs became more powerful 3D started to become a reality, but as Alan Ogden pointed out this was not for the main design; it was used to embellish and produce architectural impressions and visualisations. And this has had the negative effect that the understanding of 3D on computers has come to be associated only with these tasks. Doug Bevan also feels that "within the industry producing 3D output has come to suggest extra work. This myth is perpetuated by people's understanding of old 2D and 3D workflows where two parallel workflows, one for 2D construction documentation and one in 3D for co-ordination and visualisation still being attributed to modern 3D workflow methodologies.

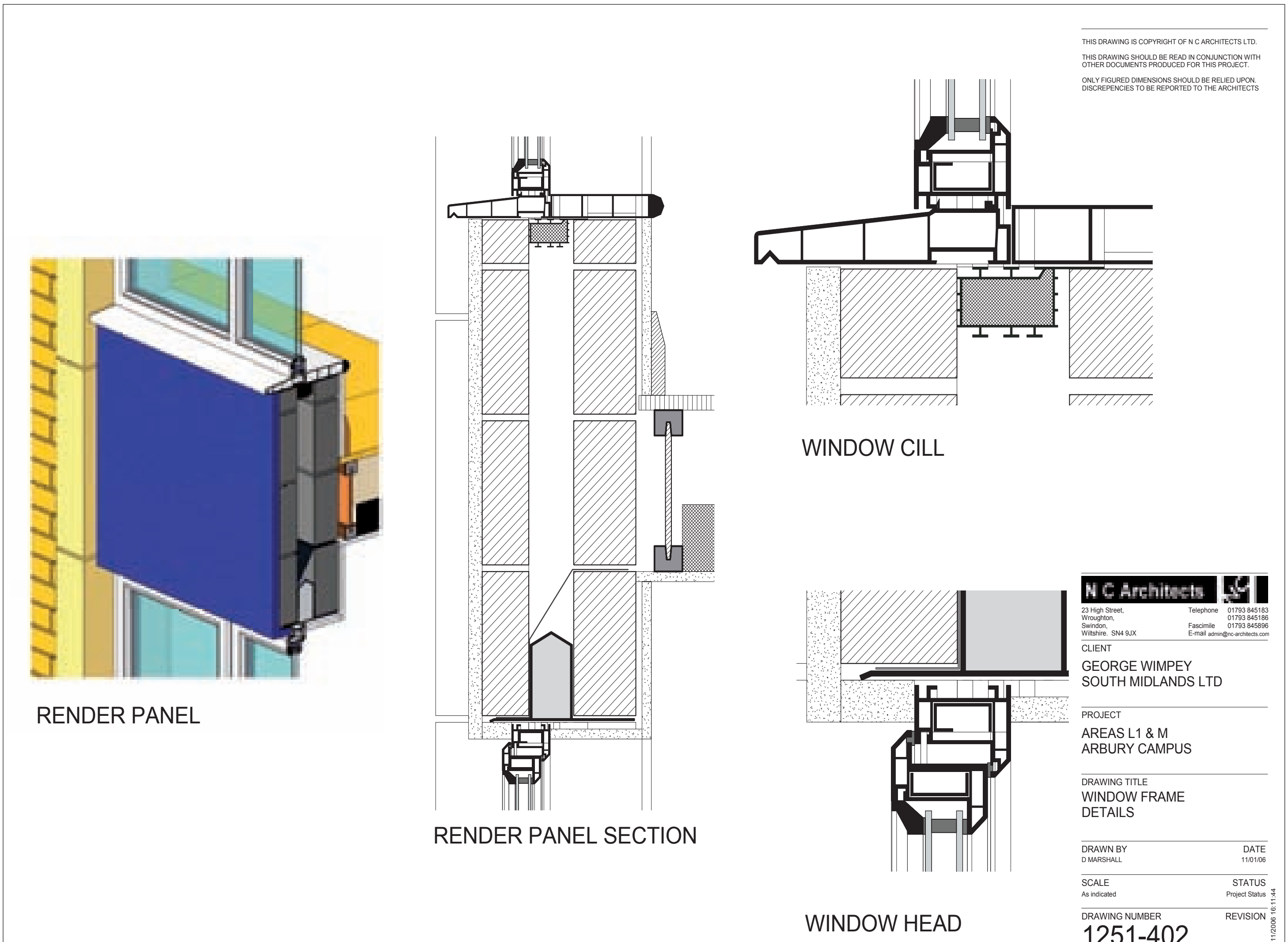
But "now 3D design is easy", says Alan, "if you use the right tools in the right way". And Doug Bevan adds "it is easier now to design in 3D yet we still produce details separately in 2D – so once again we lapse into doing things twice!"

Both individuals seem convinced that 3D is the way to go from an overall design perspective and at a detail level. But they also recognise that this will take time to become common. According to Doug, "people tend to be set in their ways even if they are less efficient than they could be", and Alan agrees but suggests "such people should not hold organisations back".

Putting it into Practice

Already Arup and Halcrow are moving in this direction either in exploration or in actual projects. According to Alan, "3D detailing is happening now but only amongst a small group of people – those who thrive in using the





NC Architects believes that the use of 3D detailing reduces the risk of wrong interpretation.

newest technology to the fullest." But they use it where appropriate, and from a 3D model extract the 2D or 3D information to place in a drawing according to need. To quote Doug, "the electronic or printed drawings are just a way to communicate the design intent" and according to Alan "these new tools and techniques provide an opportunity, not a necessity, to present information in either way at no extra cost."

However, this vision of 3D detailing is not solely the suggestion of big multinational corporations. At the same user group meeting NC Architects, a practice of nine architects and technicians based near Swindon, were also presenting some of their work. One aspect of this was 3D detailing which they had been experimenting with and now using! Practice Director Derek Marshall, was keen to show how far they had pushed Revit and how they were now producing detailing from Revit models including 3D detailing. His view is that "the drawing is all about communication and the use of detailing in 2D and 3D with illustrations is fantastic – not just pretty but a practical explanation and one which reduces the risks of wrong interpretation on the site". Of course he realises that the entire building model cannot have the highest level of detail as that would make the data too clumsy and slow to work with. However, the use of call-outs and of detailed Revit "family", component with parametric values that NC Architects are creating can be efficient and reduce risks. Also the utilisation of Revit for 3D detail design forces you to think more about how it will be built on site as to quote Derek "you focus more on the component and construction issues than the basics of how to draw something - and it's fun". Derek acknowledges that at present it is taking time to build the library of parts but he is confident it will save time in the long run while also "saving the client money and aiding the practice by ensuring more repeat business". Like Doug Bevan and Alan Ogden he believes that it is inevitable that every organisation will go down this route; and they all suggest that within five years they expect most to be working in this way.

So a discussion prompted by what might have been dismissed as a visionary thought from one company rapidly turned into not just a shared view, but one where real work was being done and benefits derived. If, as all those present agreed, "that it's all about communicating design intent" then techniques which make that communication easier using software which allows the architect or technician to focus on the design more than the drawing and have fun must be a good thing. So maybe 3D detailing is not so radical after all and it could become common a lot faster than even the five years predicted.

www.excitech.co.uk

This article was written by Bob Garrett, Marketing Director, Excitech.

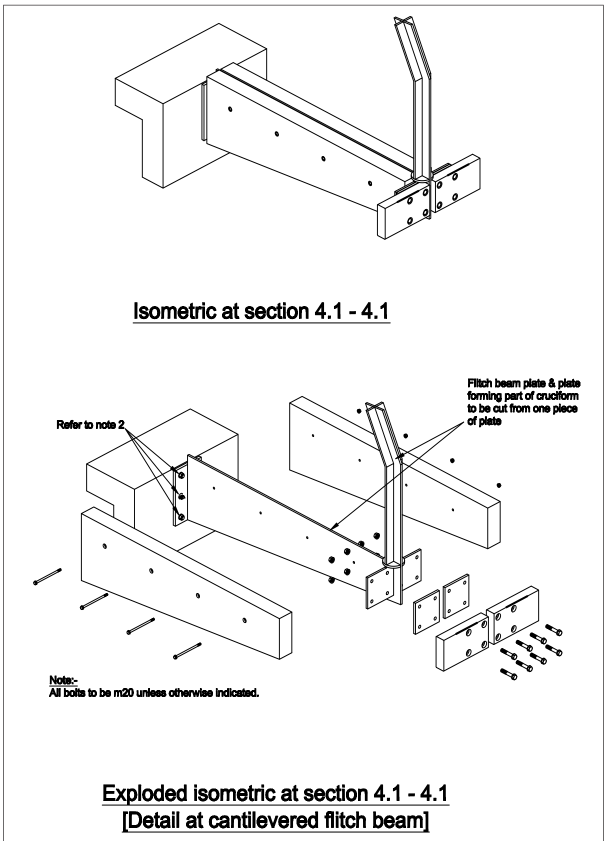


Image courtesy of Arup

Look around you (closely!)

James Cutler, CEO at eMapSite explores how the explosion in the ability to capture, store and mine all kinds of data digitally allows CAD and GIS practitioners to play an ever more valuable role.

This article, about pervasive data networks and what they mean to GIS and CAD practitioners in the context of the business they work in, has been handily interrupted late in its preparation by the Information Commissioner's "Report on the Surveillance Society"[1] . In it much is made of the ubiquity of the active and passive data capture and utilisation technologies that impact every aspect of everyone's life. This article explores how the explosion in the ability capture, store and mine all kinds of data digitally allows CAD and GIS practitioners to play an ever more valuable role.

So, what do we mean - what is being "captured"?

And what does it mean? Perhaps it is this that is best illustrated initially:

- we grumble (as the British are wont to do) about CCTV (4.2m cameras), speed cameras (6,000), junk mail (billions).
- we wonder (or perhaps we don't) at personally targeted advertising on iTunes or Amazon or in our mail as a consequence of our loyalty card membership (an incredible 50% of the population are in the Nectar card private data network).
- we are glad to create customised RSS feeds to sift out the daily detritus of our online worlds.
- we are grateful that number plate recognition allows for pay as you drive in Central London.
- we reluctantly undergo biometric, psychometric and psychological testing in or for the workplace.
- we marvel at the supply chain that keeps the shelves of our shops stocked with just what we like (and our roads replete with just in time delivery vehicles of every shape and size).
- we watch awestruck as the Thames Barrier glides into operation as a consequence of river, rain, lunar and tidal monitoring.
- geofencing of goods and people makes us safe.
- we shiver at the thought that 1/6th of the former East German population were informants on their fellow citizens.
- we pay more for houses in reportedly low crime, high educational attainment areas.
- we wonder who carries out chemical or radiation sensing (and how).
- intelligent housing / domestic robotics (domotics anyone?) – automated energy conservation, sound and lighting control, security management, garden maintenance (no smirking please).
- we rarely remember that Google reserves the right to store all your web activity to search it at a later date.
- we relax knowing that an elderly relative's drug regimen will be administered exactly according to prescription (medical sensing).
- we worry that we might be wrongly delayed, detained, arrested or otherwise inconvenienced online, at the checkout, at border controls or on the road due to some clerical error or historic folly (and trust that the right ones are apprehended and that we won't become a credit risk).
- we read that despite the investment in CCTV, many types of particularly public nuisance type crime have barely diminished.
- we are delighted to gloat to colleagues about the latest real time traffic service that got us home without running into any jams at all on a Friday evening.



Where's this taking us, why's it relevant to us, what's involved?

Apart from recommending the report to you, it is very relevant to us as the cadre of professionals whose task it is to design and build Britain's infrastructure.

It's a real shot in the arm when real time traffic services get us home without sitting in horrendous traffic jams.

Any activity in any sector (transport, communications, health, education, residential and commercial development, utilities, leisure and entertainment et al) has for in some cases many years either required or included or both the use or integration of technologies that allow them to function.

The technologies themselves are beyond our scope other that to list some of them by broad technological area for your further research should you be interested (but some are of course already integral to our activities):

- tagging and tracking technologies (GPS, RFID, ANPR , transponders, mobile phone triangulation, SiRF location enhancement)
- audiovisual recording (CCTV, webcam, traffic cam, camera phone etc)
- telecommunications (from cell phones to Bluetooth, Zigbee and much more)
- digital computer technologies (databases especially)

Much of this should be no surprise to us at all as professionals – we do after all depend on data, and the tools that translate that data into information that supports the decision making process. We are glad of that data and of the people (statisticians, analysts, actuaries) and technologies that collect and crunch the raw material into useful nuggets.

Footnote 1. www.ico.gov.uk/upload/documents/library/data_protection/practical_application/surveillance_society_full_report_2006.pdf

So, we can agree, these technologies are necessary, desirable even – improving entitlement and access to public and private services, enhancing healthcare, fighting the bogeymen (terrorism and serious crime) - and certainly useful in context. As professionals we have more data at our fingertips as we seek to design and build infrastructure that will directly influence the lives of those using it. Surveillance is not a conspiracy theory made real and is unlikely to diminish; the technologies with us now and due to arrive over the next decade are large scale, woven into the fabric of our lives, almost or actually invisible and we need to understand and use them intelligently.

Where we as professionals must be vigilant is in our participation in the design of the data capture systems and of the systems that store and analyse this information and especially in how we then pick up the results of those analyses in the development of solutions to them. OS MasterMap affords a geographical framework into which we can connect this data, over which we can display our analyses and with which we can create new (local) worlds. There is of course an extensive series of identifiers in the geospatial world:

- OS MasterMap feature, address or transport network TOID (Ordnance Survey)
- Postcode Address File now including Multi-Residences Without Postal Address (Royal Mail)
- Unique Property Reference Number (UPRN) from the National Land and Property Gazetteer (NLPG) – see below
- Unique Address Reference Number (UARN) – from the Valuation Office Agency
- Land Title reference
- Administrative units - Enumeration District, Ward, Parish
- Sampling Units - Census Output Areas
- Media boundaries (phone, internet, cable, TV, news, radio - used to determine what you receive in terms of advertising, media content and market research)
- Postcode sector (underpins most expenditure, lifestyle and neighbourhood classification and segmentation tools for profiling, catchment area and site location analysis including ACORN, CAMEO and PERSONICX GEO)
- Geographic position - latitude and longitude, OSGB grid coordinates

This list excludes all reference to the other systems that might identify us but does serve to demonstrate both the diverse operational context for planning and decision making and the basis for the news-friendly sound-bite of the "postcode lottery".

It also illustrates that there are multiple and in some cases competing (owing to commercial interests), conflicting or even complementary mechanisms by which we (and those that watch over us) can reference us in the landscape.

As local authorities retain significant powers in the planning and development framework, it is worth looking a little closer at the tools they use to help govern decisions that involve our industry extensively.



The NLPG includes separate units of properties in multiple occupation such as these blocks of council flats in Leeds.

The National Land and Property Gazetteer (NLPG)

The NLPG covers the whole of England and Wales and contains more than 30 million residential, business and non-mailing addresses. It is a comprehensive and continually updated database, created by each local authority, the body with legal responsibility for street naming and numbering of property.

The NLPG uses the BS7666 standard (Parts 1 and 2) to ensure data format consistency across the country. Each record includes a unique property reference number (UPRN) which provides a reference key to join related address records across different datasets.

Local authorities are the creators of address data (obtained through their activities such as planning applications, building and environmental control, licensing, the electoral roll, council tax and non-domestic rates) and manage the address throughout the 'property lifecycle'. The NLPG includes separate units of properties in multiple occupation (like flats, retail units or office blocks), land, buildings within complexes (such as hospitals, schools or universities) and other structures (such as churches, scout huts and war memorials) and the history of all changes to those properties. There are currently more than 4 million such objects in what is as yet a far from complete NLPG.

Beyond the Local Authority

Many local authorities are under considerable pressures for planning and development – from limited resources, from central government, from lobbyists, from e-government targets and more. Plentiful information and research, well presented in support of a particular proposal or policy direction might well be considered helpful. Inevitably perhaps the ability to harness and wield that information can skew the development process. For example, automated systems of classification or segmentation – "profiling" – can result in or support a particular view or preference.

Profiling is dependent upon the collection, aggregation and mining of vast databases of individual data, often held by private enterprise and its analysis can be determined by the user. The results may meet a narrow even opportunistic agenda but they may also blur the bigger picture, particularly in an increasingly risk-averse culture where social stratification provides its own answers (as Disraeli would have it, "lies, damned lies and statistics").

So instead of visionary planning of for example traffic free city centres or focused health and education interventions the case may be made for more CCTV or failing public services – it is all a matter of perspective.

We are smarter than that and we should seek to ensure that we are part of the system. "Everything happens somewhere", and it is the inevitable outcome of all these real time data collection systems that they will be viewed in their geographic context (be it demographics, psychographics or behaviour). This is ideal when extending or removing flood control infrastructure certainly, but is ideal also in identifying the nature of new health or education interventions (programmes, plans, projects), and ideal too in ensuring that holistic approaches are taken to planning residential and commercial development.

Part of the irony of these hugely rich information streams is that they do allow for the creation of an incredibly well planned society. As pivotal participants in both the upward assimilation of data and in the downward translation of the resulting decisions into the landscape we must not be passive, but constructive, contextual and visionary.

There are many "IT" words - ambient, immersive, pervasive – for the digital surveilled world around us. We do not need to be distracted by these but rather ensure that our tools (for data collection, aggregation, assimilation, management, analysis and critically, presentation) enable us to interpret the consequences of these systems in order to ensure that we construct a world that we are proud of (think of positives in the initial list).

This article was written by James Cutler, CEO at eMapSite, a platinum partner of Ordnance Survey and online mapping service to professional users



Fabsec FBEAM 2006

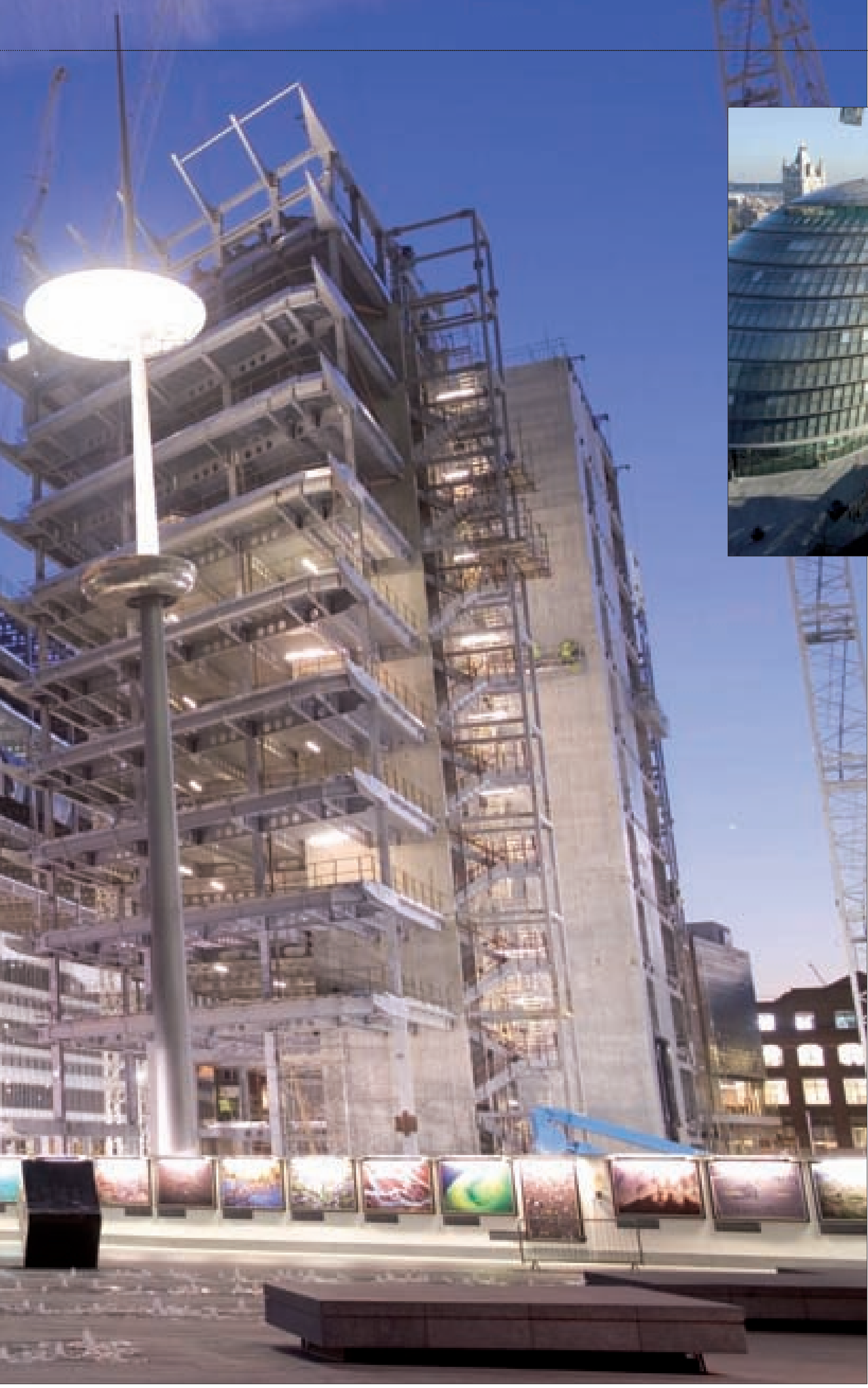
The use of cellular steel beams is on the increase in the UK construction sector. But in order to make the most of this weight saving technology, you need a design tool that engineers find easy to use says Greg Corke.

Demand for structural steel has risen steadily in the UK over the past few years and it is now estimated that over 70% of all multi-storey buildings use some form of steel framed construction. And while demand is pushing up material costs, clients are also expecting more for their money, which means structural engineers are continually looking for new construction technologies to keep that competitive edge.

One such technology that is grabbing the attention of engineers is cellular steel beams. One in three multi storey buildings are now constructed using this system, which boasts longer spans while using less

Fabsec beams give the engineers the flexibility to place web openings exactly where they want – in this instance (right) away from where the secondary beam joins the primary.







Cellular beam construction adjacent to City Hall, the headquarters of the Greater London Authority and the Mayor of London.

steel (particularly when used as a composite beam) and can also lead to a reduction in overall building height as services can be fed through the cells in the web of the beam.

One company that has been pioneering the adoption of this type of construction is Fabsec, which since its inception in the year 2001 now has a production capacity in excess of 50,000 tonnes per year. However, unlike most cellular beam systems which have their webs peppered with holes, the cells in Fabsec's beams can be cut exactly where you want them prior to going on site. These can be circular, oval or rectangular and can be positioned and sized to coincide with specific building services requirements, or the web left intact so that secondary beams can be easily welded on.

Naturally with such flexibility in cell placement, the design and optimisation of such beams is more involved than with standard sections and there needs to be an efficient design system in place to deal with this. Fabsec's solution to this is a free software tool called FBEAM, which enables engineers to design both composite and non-composite cellular beams with ease, both in their ambient state and in fire conditions.

Beam design and optimisation

FBEAM uses a Wizard style process to guide the engineer through the design process. For simple beam design, the software offers up a number of standard templates. In the case of a custom cell composite floor beam, engineers must first enter data regarding the type of slab, the spans and arrangement of the floor. This is followed by a whole host of loading details, including imposed loads, point loads, and end moments.

Moving onto the actual beam design, FBEAM initially suggests a 'rule of thumb' starting point for the section size of the beam followed by flange sizes, but these can be edited by the engineer. Providing maximum flexibility in design, top and bottom flanges can also be of different sizes, as can depth along the section to create custom tapered beams.

Next up, custom or standard cell arrangements can be generated using the built in web opening tools. These can be generated automatically along the section by spacing or 'number of' or produced individually according to size, location and type. Naturally, FBEAM provides full editing functionality, to accommodate a large air conditioning duct for example, but the software will automatically flag up anything that does not comply with basic design rules, such as when hole sizes are too big, or if an opening is located below a point load applied to the top of the beam.

Once the beam is designed engineers are given the option to either analyse the beam as is or to optimise it to find the perfect balance between strength and weight/cost. N.B. Cost is based on cost of steel plus cost of manufacturing processes such as amount of scrap and weld runs.

The system checks for typical design criteria, such as shear force, bending moments, web buckling, and deflection, and will warn the engineer if it fails any of these checks.

For the optimisation stage, beam parameters

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such as depth, flange width or web thickness can be left totally free, fixed at a specific value or set within a range. The software then uses an iterative design algorithm to calculate which elements of the design are over and under utilised and adjusts them accordingly. Considering the amount of calculations the system is doing it's a very efficient process taking a matter of seconds, but beams can also be batch processed, so you can go off and make yourself a cup of tea if you want to optimise all the primary and secondary beams in a steel framed building in one go.

Fire engineering

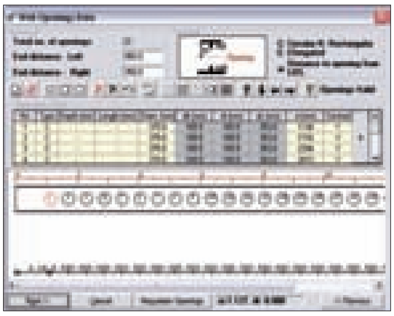
In addition to designing and optimising at ambient temperatures, FBEAM can also be used to design fire engineered beams which provide up to two hours of fire resistance. Unfortunately this functionality is only available to selected customers and subject to an NDA (Non Disclosure Agreement) to protect Fabsec's intellectual property and commercial position. Leigh's Paints, a 25% stakeholder in Fabsec provides the design data for its Firetex FB120 intumescent paint, which can be applied off site up to 2.2mm thick and then, should it be subjected to excessive heat, swells to 50 times its applied thickness. Using FBEAM's Fire Engineering module users have potential for even more costs savings in the optimisation process. This is because the software looks at the effect of using different beam cross sections and coatings in conjunction with one another, rather than on an individual basis. For example, increasing the mass of steel by, say 10% (and hence increasing the fire hesitance of the steel itself) and using less paint could turn out to be cheaper than using less steel and more paint.

Project capability

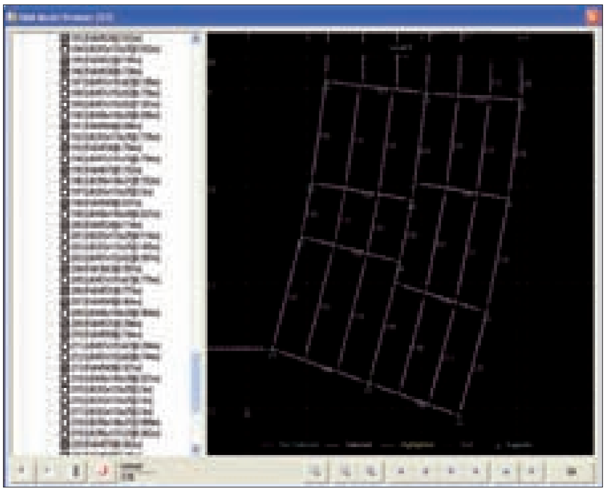
New for version 2006 is a project facility which enables users to create projects to encompass all the beam designs and organise them by groups such as floor levels or roofs. A Group Edit facility now makes it easy for last minute design changes to be incorporated, such as loading modifications. This enables beam parameters (e.g. size, loading, cell arrangement) to be changed globally, where a change in one beam can be propagated down to others. In previous versions of the software this had to be done on a beam by beam basis.

Structural analysis links

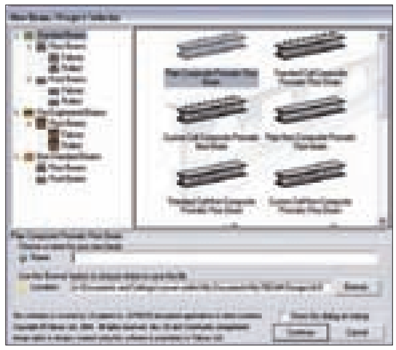
Integration between different structural software is becoming more and more important across the industry and for this latest release Fabsec has followed this trend with a two way link between FBEAM and the RAM Structural System, a structural analysis solution from RAM International, the company recently acquired by Bentley Systems. Using the FBEAM plug-in inside RAM, engineers can select any standard Universal Beams which they would like to convert to Fabsec sections or alternatively the system can flag up any candidates which it thinks are likely to have any substantial mass or cost savings - in most cases these



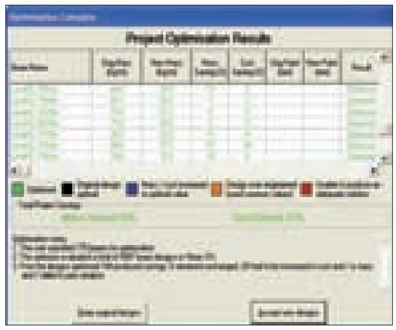
FEBEAM provides the engineer with a full set of web opening design and editing tools so cells can be placed exactly where required.



Fabsec provides two way associativity between FBEAM and RAM Structural System, a leading structural analysis software package.



FBEAM offers a full set of templates for the design of both composite and non-composite cellular beams.



Beams can now be edited or optimised globally, by individual floor groups or entire projects.

are long span sections.

RAM will then export these sections, together with their loads, so they can be designed inside FBEAM. Beams are to be found inside a project navigator which enables engineers to easily see each beam type, where it is located inside the building and its analysis state. These can then be designed, analysed and optimised in the standard way, either individually or on a group by group basis, and once complete the data can then be imported back into RAM Structural System to coordinate the structural model.

Conclusion

By transforming standard Universal Beams into Fabsec sections typical weight savings are claimed to be in the order of 20-25%, and with this in mind it's easy to understand why Fabsec is now producing over 50,000 tonnes of beams under license every year. However, in addition to material savings, there are many additional benefits to be had from its cellular beams. Spans of six to eight metres are eminently achievable, meaning bigger uninterrupted office spaces; there are fewer structural elements to erect on site; and because the services can be fed through the beam instead of under it, developers can lower the overall building height – which can lead to a reduction in cladding costs, additional floors within the same building envelope.

However, many of these benefits would be lost in the mix without an intuitive and cost effective way of designing these long span cellular beams and with FBEAM 2006, Fabsec looks to have just the tool to do this. FBEAM is an incredibly easy tool to use. It's a simple product designed for a specific task and with its Wizard-based approach and tutorials embedded in the free CD most engineers should be able to hit the ground running.

The link to the RAM Structural System is an interesting development for a product which until this latest release existed predominantly in its own sphere. However, this development work is not finished and workflow between the two products will be refined in future releases, plus Fabsec is also talking to other structural design and analysis software vendors to broaden its reach.

In FBEAM you won't find an eye catching 3D modelling environment common to many mainstream structural software products, but for most users ease of use and simplicity is more important than bells and whistles. And when considered as part of an overall structural solution, Fabsec is delivering a very attractive proposition which could help structural engineers get an edge in an increasingly competitive marketplace.

Who is Fabsec?

Fabsec is a joint venture company with 25% ownership held by UK steel fabricator, Severfield-Rowen, William Hare (the largest privately-owned steelwork fabricator), Leigh's Paints (intumescent paint manufacturer) and Corus (metals producer).

Design files created in FBEAM can be utilised directly by Severfield-Rowen and William Hare subsidiary, Cellbeam for the automatic manufacture of Fabsec steel beams.

Product: FBEAM 2006
Supplier: Fabsec
Price: £FREE
Web: *www.fabsec.com*

Oasys Mail Manager

There are many different files that need to be kept backed-up when working on a project. It seems there are lots of products that manage CAD files and very few that manage those all important emails.

It's one thing to track changes to a section, plan or elevation, but the chain of emails that might have led to that change have not always been that easy to have been found or backed-up. These days, our electronic documents and communication can easily inundate us with information. Whilst many firms choose to deploy a specialist document management system for CAD drawings and models, most emails are stored in a generic email client, normally Microsoft Outlook.

Oasys, an Arup firm, and developer of the popular Columbus Document Management tool has come up with an easy to use software layer, which sits on top of Outlook and provides some clever automated tasks and prompts to help each user as emails come in or are sent out. A key advantage being that emails can be stored in Windows standard folders, bringing related data together - for example by project. To some extent, Mail Manager follows in the same vein as Columbus which acts like an extension to Windows Explorer but here, it extends Microsoft Outlook. Again, the philosophy is similar in that Oasys products don't rigidly force you to stay in control of your documents, just provide the tools, should you so wish to do so. Many other systems would use a vault, or some structures kind of database but Oasys products tend to help you manage yourself, than rigorously enforce rules.

Because Mail Manager is based on Outlook, users take to it easily. It lets you treat emails as if they were electronic documents, storing them or letting the user drag and drop them or automate their archival. It prompts users as they work through their mails to store them and this then makes all emails about a project instantly available to all those with rights to access that directory. This also aids in the QA process as it's easy to see who filed things and when.

What it does

The software has been in development for over two years at Oasys. As Mail Manager requires Microsoft Outlook, you need to be running the 2000 version or later. Once installed administrator-based configurations can be set up and remotely deployed to all machines, so all team members have the same filing folder structure. This can be any structure and is totally user definable.

Once the folder structure has been decided and emails get stored in the folders, it automatically re-names the files (Outllook's standard naming convention leaves a lot to be desired, especially for search) and is user configurable. Almost like a database field, Oasys suggests a long string in a standard form, including: date/time/name of sender and subject. Attachments can be stripped out or copied out to populate other folders and the system can rename the attachment, by possibly adding the date and time the file arrived into the existing name. The system automatically checks to make sure that it doesn't replicate file names.

Mail Manager can be configured to handle different simultaneous projects very easily, using a nested tree structure for the various mail folders. The system can enforce users to use the filing options, which include such workflows as review and notify participants.

Looking at a typical Inbox nothing appears to be that different from normal Outlook until you open an incoming message. Mail Manager then brings up a pop-up which offers a number of different places where that email could be stored. If it's a job that the system has seen before then it will suggest a folder that was previously used, as a best guess. It's actually a pretty clever system.

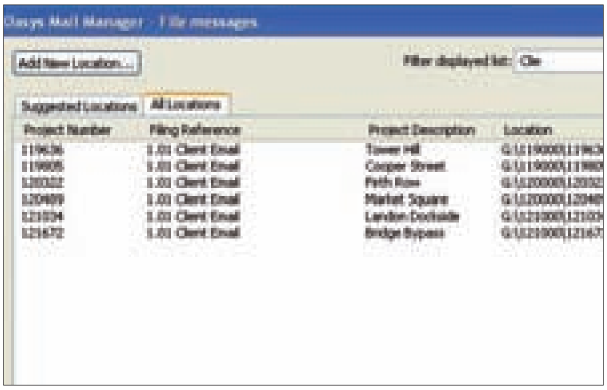
When sending files, after the mail has been sent, a Mail Manager dialogue prompts you for an action, suggesting where it thinks you would want to file the email. Again it builds this 'intelligence up' by learning who is sending the email, who it is to and where those emails usually get stored. These emails are stored to standard Windows folders on the desktop or server and you can use standard Windows features to protect the folders.

If you were to search for an email, or content within, then Mail Manager runs with the level of permissions and locations allocated to you by the Windows system. The search capability is very powerful and greatly enhanced over standard Outlook, allowing searches on names, locations, from to, subject etc. So it's possible to look for all documents filed today in specific client's project. Mail Manager has a built in ASCII preview tool, which provides near instant searches. In the next release, which is due out shortly, this preview window will include rendered material.

The system is very flexible. Emails stored in folders can be dragged and dropped back into Outlook to forward them etc, you can deploy the software on on-going projects and do a bulk store of files. Unlike a typical vault-based management system, Mail Manager is not destructive as the files can always be added back into Outlook. Although there is an option to delete the email once filed. This reduces the burden on folks with huge public folders of emails on your Exchange server.

There are a number of 'workflows' that Mail Manager supports. For document review, there's a checkbox option which supports multiple names, so a document could be sent to a list, opened, reviewed, recipients check off the box and then the emails will be filed and stored. Tasks can be created using Mail Manager's "Send Task request" option which significantly improves the process of creating and assigning a task. Once assigned, its progress can be monitored from Outlook. In creating the task it will automatically include links to the filed email, reducing the need for CC's and duplicate emails. To 'Notify', Rather than using forward or CC, and thereby adding to your email storage, Mail Manager can create a notification email that contains a link to the filed email. Recipients just select the link to view the filed email and mark it as reviewed.

Mail Manager costs £107 for each seat between 1-5 licenses and £80 per seat between 6-25 seats. For installations over 10,000 seats, Mail Manager drops down to £21! Three is a maintenance and support cost which equates to 20% of the purchase cost per annum. There is also a trial version online, where it can also be purchased. Mail Manager is also being sold through UK AEC dealership Excitech.



Mail Manager can be configured to handle different simultaneous projects very easily, using a nested tree structure for the various mail folders.

Conclusion

There is a huge need for a tool like this in many industries but in the AEC space in particular, where people work simultaneously in multiple teams on multiple projects and need to have some interaction with their mailbox tool to help them file things in a meaningful and structured way. Not just for themselves but for other project and team members. The only real issues are ones of deciding the folder structure; the rest Mail Manager makes easy.

Mail Manager is a really quite ingenious. It's neither expensive or complicated but it does something that there's a huge need for. Companies or individuals looking to have some aid in keeping correspondence together and managing emailed information, will find Mail Manager really beneficial.

www.oasys-software.com

Software service for your hardware?

From memory management to hard drive and driver optimisation, Robert Jamieson gives his top tips on how to spring clean your workstation for optimum performance.

Last week I was touring with a CAM software company and was asked to add some tips to the PowerPoint slides about how I keep heavily used systems performing at their best. I have also had repeated requests to document my top tips in more detail, so here goes.

I'm going to start off by apologising that this article is focused on Windows XP (x64 and 2000 are similar) and not Linux, though some of the principles are the same. As some of what I suggest is potentially dangerous to your data I accept no responsibility if you implement these and cause damage to your workstation!

Memory

Memory is always my first target, being one of the fastest storage devices. Yes, I know it gets cleaned on a restart but on start-up do you know what programs you are loading into it? The first thing to do is check the start-up off the Windows programs tab to make sure that you actually want everything in there to be in there. A more advanced version of this is 'MSCONFIG' which you type in at the command prompt after clicking Start, then Run. Leave all the other tabs alone and click on startup at the top right. Listed here are all the programs that are really started on start-up. A lot you will not understand but you can identify what they are by stretching out the command path. I take out things like "IBM messages" as all this does is tell me nice things about IBM! Often trialled programs and virus get listed here including a lot of IS forced updates therefore delete these but at your IS's wrath.

On restart, MSCONFIG will come up again so you can reinstate programs if you need to. There is a tick box in the bottom left to switch it off once you are happy. I managed to reduce the loading time of the old IBM laptop we were using for the tour by 30 seconds (it took 3 minutes before). Taking out these little programs also stops the fragmentation of your memory and makes it easier on memory page loading.

The next memory cleanup operation is to add the /3GB switch to the Boot.ini file in Windows to give you access to more memory (as long as your machine physically has it). By default Windows XP can only see 2GB of RAM but with this option supported applications can see 3GB. 3ds Max, Inventor and SolidWorks support this, for example. You can edit the boot.ini in Control Panel, System, Advanced, Start-up and recovery, Edit. Copy and past the line starting multi(0)disk(0)rdisk(0)… and edit the description in the brackets with 3GB and add an extra /3GB /USERVA=2800 so it looks like for example

multi(0)disk(0)rdisk(0)partition(1)\WINDOWS="Microsoft Windows XP Professional 3GB" /fastdetect /3GB /USERVA=2800.

The userva switch pulls the memory usage back a bit giving graphics cards room to breathe. If you make a mistake the system might not boot so be very careful you know what you are doing!

Hard drive

I always set my swap space to be a same size (Min and Max) so that a certain part of the disk is always allocated. If you let it grow and need more virtual memory this could end up fragmenting the hard disk. 2GB is a typical value and you can find this in System, Advanced, Performance and click settings. Next click Advanced and click change near Virtual Memory. Then set the initial and max to the same value.

Now that you have your swap space allocated what about the condition of the rest of your hard disk? If you clean out your temp files or junk on your drives and then defragment you can improve your performance for two reasons. The first is that all the data of one file is close together and can be read in one go. The second is that the outer part of a disk is faster than the inner part as in one revolution the hard disk heads pass over more area - more area equals more data. So how do you delete these files? The first place is the internet cache in IE (Internet Explorer) Tools, General, Delete files and cookies.

CAD applications can also create a lot of temp files and you will need to look at the applications path to delete these. Windows temp files can be stored in c:\windows\temp for example, even if they are very small lots of them need to be handled by the FAT (File Allocation Table) - the bigger the table the slower it is. I also do a search for files based on size, Search from explorer all files *.* and click "What size is it" put in 2000 (2MB) and I'm sure you will be surprised on what junk you have. Remember archiving data off to a DVD ROM is always a good idea. Once you have done this and emptied your Recycle Bin you can use Windows defragment tool. Right click on the drive you want to defragment, click Properties, Tools, and Defragment Drive. The downside to this defragmentation software is it's only a basic version and will not move or defragment the swap file. For this, you need to use software like Diskkeeper which is available as a fully functioning trial version!

Cleaning up your hard drive by getting rid of all those unwanted files and defragmenting can significantly improve your data access speed.

Drivers

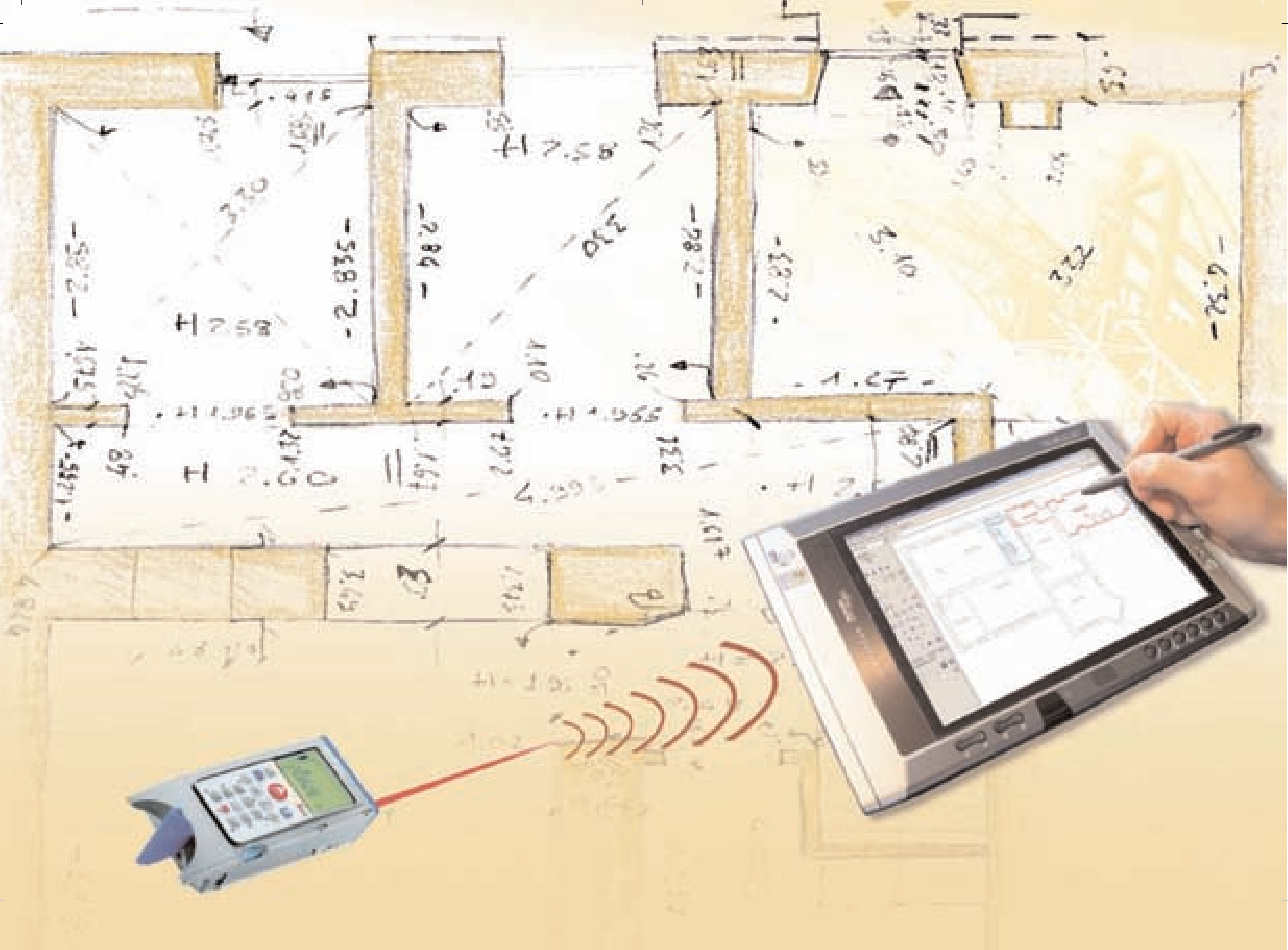
The next thing to do is update your drivers. For graphics check your CAD software company's latest certificated driver. If this is hard to find go to your graphics brand ATI (AMD now) or Nvidia, for example. Once you have downloaded this check in the drivers options to select the CAD application you are using, right click on the Desktop, Properties then Settings, Advanced, Configuration and select your profile. In the later FireGL drivers this is set automatically but check the readme file with the driver to confirm this for your application.

Another issue I still see today which is worth a check up is the "chipset driver" these control how the motherboard talks to the graphics card. Don't expect this to be automatically installed by Windows even if it's not listing a problem in device manager. The easiest way to fix this is to look for chipset update software from your workstation vendor. This can give a surprising boost in performance.

Servicing your car is expected but servicing your computer is not. It is typical that systems get furred up over time but the more drastic method of flatting a computer and starting again is so time consuming today especially if you have to acquire new codes for your software, so it's just not done anymore.



Robert Jamieson works for the hardware manufacturer AMD.
robert.jamieson@amd.com



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